Southern Power & Industry

The Industrial and Power Journal of the South ... Southwest

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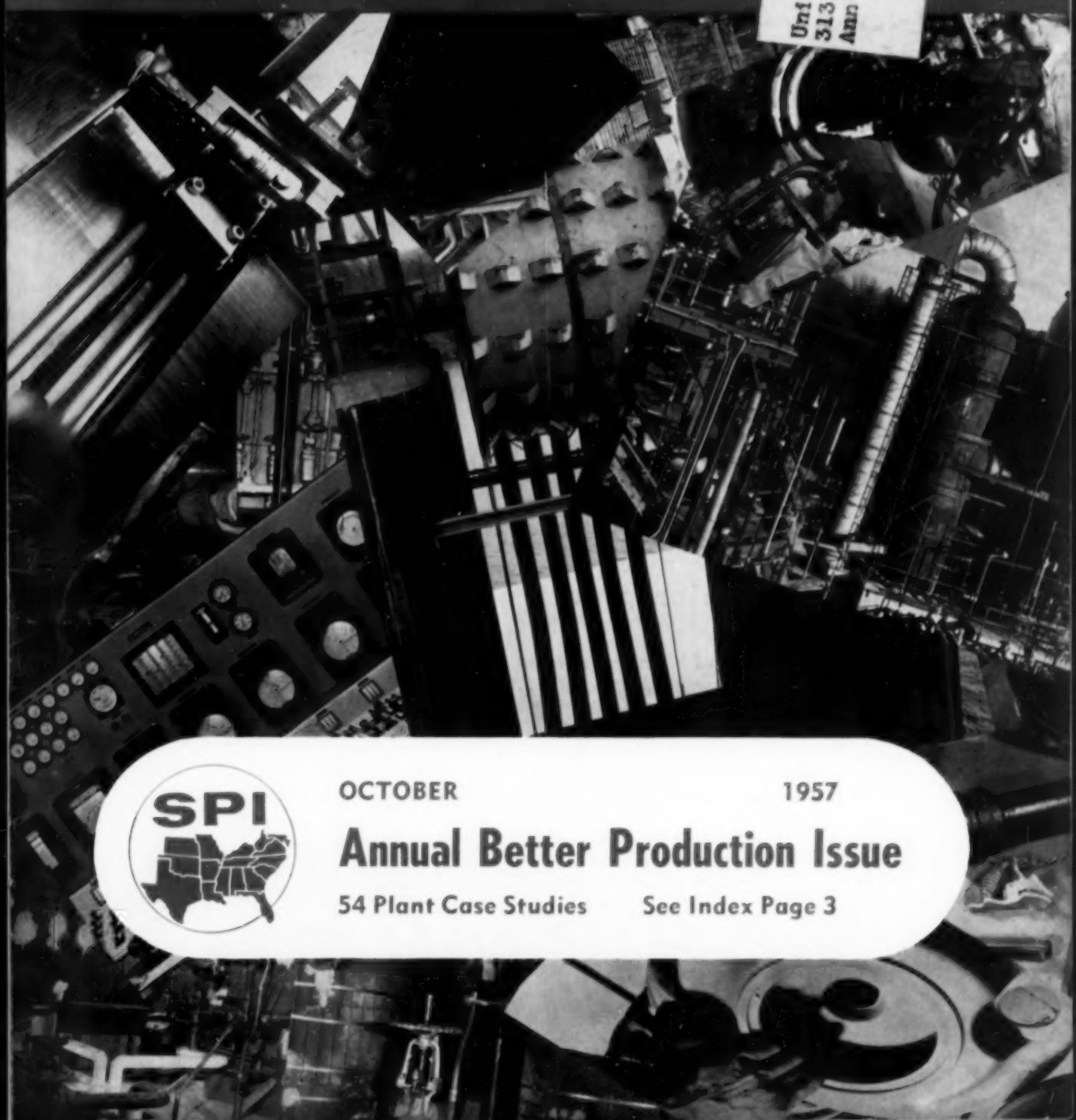

SPI

OCTOBER 1957

Annual Better Production Issue

54 Plant Case Studies See Index Page 3

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Space Heater is weather protected

(and corrosion-proof!)

Weather-protected heaters are standard on Allis-Chalmers outdoor motors . . . prevent moisture condensation on motor parts during shutdown periods. These immersion-type heaters are not only water-proof, they are also stainless steel clad for resistance to corrosion.

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Volume 75 Number 10

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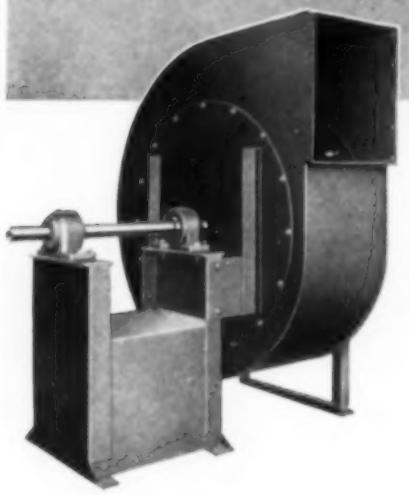

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Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

Eugene W. O'Brien
Managing Director

Vol. 75
No. 10

OCTOBER, 1957

54 Better Production Case Studies

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Facts and Trends

October 1, 1957

◆ FULLY AUTOMATIC INSTRUMENTATION—The new 200,000 kw unit of the Sterlington Steam Electric Station of Louisiana Power and Light Company will have a Daystrom operational information system, expected to provide a degree of accuracy and reliability unattained in any previous system.

An Analog-Digital Integrating Translator converts analog values, such as voltages from a temperature indicating thermocouple, into number or digital values which can then be used for computations in high speed digital computers or "brains." Unit is completely transistorized and has no moving contacts. System will cover measurements at 350 points throughout the power plant. Of this total, 100 points will be automatically logged every hour. Details will be featured in SPI for November.

◆ GASES IN . . . ELECTRICITY OUT—Direct conversion of the chemical energy of gases into electricity has been accomplished with a new fuel cell at the Parma Research Laboratories of National Carbon Company. Fuel cell unit consists of nine hollow, porous carbon electrodes grouped in a round plastic housing. Carbon header on each end channels hydrogen and oxygen gases into the proper electrodes, and electrical connections conduct away the power. Cell is filled with solution of potassium hydroxide, which serves as an electrolyte.

First application is providing silent electrical power for the Signal Corps' "Silent Sentry"—a lightweight, portable radar set. Cells have been operating 8 hours a day, 5 days a week for the past year, with no signs of deterioration. Voltage across the electrodes is approximately one volt. You can connect a number of cells in a circuit to get any voltage desired. General efficiency range is from 65 to 80% when operated at normal temperatures and pressures.

◆ DO YOU USE SODA ASH?—Large scale consumers of soda ash solution can save valuable storage space by slurrying their soda ash with water rather than storing it the conventional way as dry powder. This is because soda ash plus a limited amount of water forms a slurry of monohydrated crystals in a saturated solution.

This economical bulk handling system was recently developed by Diamond Alkali Company. A sleeve-type check valve made of neoprene plays an important role in the system. Case Study 35, on page 88 shows how the system works at Lithium Corporation of America's plant at Bessemer City, N. C.

◆ NEW REEVING SYSTEM on a coal unloading tower at Tampa Electric Company increases production and reduces the number and extent of shutdowns required to replace wire rope used for hoisting and closing of the 6 1/2 ton bucket. System utilizes a single continuous rope for both hoisting and closing. Details are on page 104.

Brand New Idea in STANDARD-DUTY STATIONS

Here's an entirely new idea in push button stations—a wrap-around cover—with the contact mechanism part of the cover. Removing the cover exposes the terminals for instant and easy wiring. Strong, spring type, silver plated contacts connect the push button assembly in the cover with the terminals in the base.

Matching ribs in the cover and notches in the terminal blocks assure that the wiring connections are always correctly made. A bakelite shield protects the contact mechanism and prevents careless wiring from interfering with the contact operation. Concentric knockouts are provided in both top and bottom of the heavy metal base.

You will want to know about this new standard-duty station because—it is good looking—it takes less time to install—it was designed for the convenience of the installation engineer.

Let us show you a sample of this "brand new idea" in standard-duty stations!

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These "H-10's" are designed and built for rugged duty. Their stronger construction features and high-strength steel bodies will keep them in service for longer continuous periods, resulting in greater car availability at all times.

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Commerce Building
Telephone Liberty 2-2229
Boston 10, Massachusetts

CHICAGO
Room 604,
208 South LaSalle Street
Telephone RAndolph 6-4634
Chicago 4, Illinois

CINCINNATI
913 Dixie Terminal Building
Telephone DUnbar 1-1325
Cincinnati 2, Ohio

CLEVELAND
1819 Union Commerce Building
Telephone MAin 1-7960
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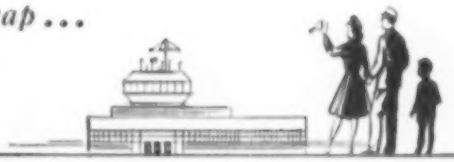
HOW THIS MODERN STEAM TRAP UTILIZES PRINCIPLE OF AIRPLANE LIFT!

New application of an old principle produces totally different type of steam trap ... of great simplicity and effectiveness

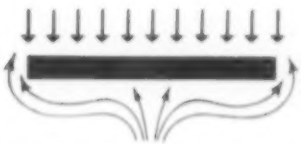


THIS GIVES AN AIRPLANE LIFT

Greater speed of air over curved upper wing surface creates lower pressure over this area (Bernoulli's Law) ... resulting in **lifting** force.

THIS SAME PRINCIPLE USED TO CLOSE SARCO TD STEAM TRAP VALVE

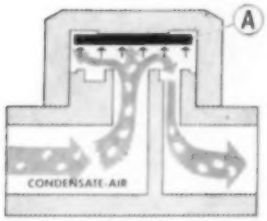
Valve is a simple hardened stainless steel disc.



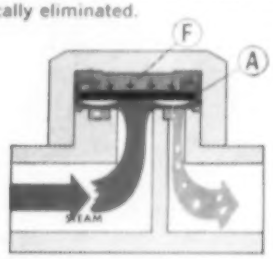
High velocity steam jet across bottom of valve disc creates low pressure area — resulting in **downward** force.

ONLY SARCO TD USES THIS UNIQUE OPERATING PRINCIPLE

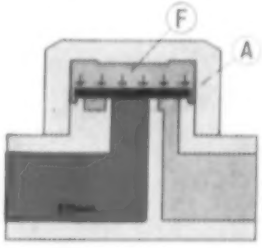
Result: Extreme simplicity—no valve mechanism—maintenance practically eliminated.



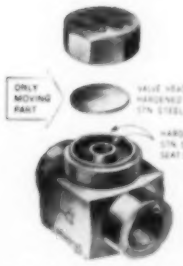
1. Inlet pressure raises disc "A" from seat ... immediate discharge of air and condensate at steam temperature.



2. Steam follows condensate and the high velocity jet across bottom of disc "A" creates low pressure area (Bernoulli effect) ... jet is deflected into chamber "F" where it builds up pressure by re-compression and this pressure acts on top of disc "A" ...



3. Pressure in chamber "F", acting on full top area of disc "A", exceeds force of incoming steam and low pressure area under disc ... and immediately forces it down, closing inlet. As condensation decreases pressure in chamber "F", disc rises and steps 1 or 2 repeat.



Small size ... large capacity

Only 3 parts ... all stainless steel. Sizes ⅛ to 1"—each body is as small as a tee fitting! Capacity is determined not by a bulky body but by the effective orifice, valve action, pressure drop and condensate temperature.

A few of many advantages

* *Practically no maintenance*—no valve mechanism, no narrow channels. Trouble-free, simple design.
* *Cuts trap inventory*—one large capacity seat for all pressures ... for heavy, light, or no condensate load.
* *Self-adjusting for pressures 10 to 600 psi*—not a single change or adjustment required.
* *Operates perfectly when pressure fluctuates*—throughout full pressure range.

SEE FOR YOURSELF

We will gladly send you a Sarco TD Steam Trap and strainer for 60-day trial. No cost or obligation. Advise size —⅜, ½, ¾ or 1"—and application. Sarco Company, Inc., 635 Madison Avenue, New York 22, N. Y.

2204-C

SARCO Thermo-Dynamic STEAM TRAP

THE MODERN TRAP THAT IS MAKING STEAM TRAPPING HISTORY!

FOR TEMPERATURE REGULATORS, SEE SARCO AD, PAGE 113

Facts and Trends (Continued)

- MODIFIED CRUSHERS USE CHEAPER COAL—Units 5 and 6 at West Virginia Pulp & Paper Company in Virginia are pulverized coal fired steam generators installed in 1934 and 1938. Pulverizers were originally designed to develop maximum rating when supplied with coal of approximately 100 grindability, 14,500 Btu/lb.

  Fuel burning equipment was recently modified to burn coal of approximately 50 grindability, 13,400 Btu/lb. Project will be self-liquidating in two years. For details see page 112.

- COOLING TOWERS—How an automatic control system is paying off at Southwestern Public Service Company's Plant X is featured on page 64. The Bailey Meter Co. control system maintains correct basin water level under all load conditions; holds concentration of dissolved solids within very narrow limits to prevent over-treating or under-treating the make-up water; and governs the treatment of raw water make-up to prevent wasting water and chemicals by excessive blowdown.

- EXTENSIVE LIVE STORAGE RACK SYSTEM, engineered and built by The Alvey-Ferguson Company for Crown Cotton Mills in Dalton, Georgia, automatically provides fool-proof first-in first-out control of stored yarn—important because dyed lots must be kept together in order until final shipping. See page 68 for details on how the system controls inventory and saves space.

- ELECTRICAL DISTRIBUTION—What should one do when the electrical system just won't take any more? Page 74 gives details on how the problem was solved at Convair in Fort Worth, Texas.

- MORE $$$ FOR IDEAS—An employee's cost reduction idea saved the Memphis Works of International Harvester Co. an estimated $4,000 per year and earned the employee a $680 cash award. Andy C. Thurber, process engineer, suggested installation of magnetic separators on all centerless grinders to separate metal particles from coolant. Details are on page 79.

- ULTRASONIC CLEANING makes it possible to salvage many types of meters, carburetors, diesel injection nozzles, anti-friction bearings and similar devices. The new Sonogen ultrasonic generator by Branson Ultrasonics Corp. of Stamford, Conn., has a tank transducer unit 7 x 9 x 13" with effective cleaning area of 52 sq in.

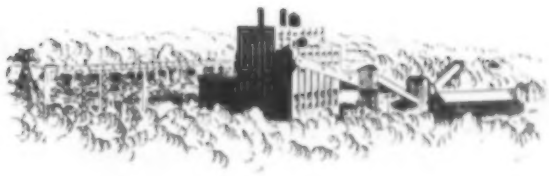
  Generator converts 115 v, 60 cycle a-c into high frequency (38 kc) energy and, by means of the transducer, transmits mechanical vibrations of same frequency into cleaning fluid. Cavitation (a continual rapid build-up and collapse of pressure) is set up, causing intense scrubbing action into holes, crevices, undercuts, etc.

  Cleaning fluid is trichlorethylene at 110 to 140 F or water solutions of alkaline detergents where redistillation and recovery of solvents is not feasible. Average agitation time with power turned on is about 1/2 to 3 min.

- COLORED ALUMINUM PAINTS and aluminum asphalt roof coatings developed by Alcoa make possible metallic protective finishes that will waterproof, insulate, decorate and preserve nearly any type roof or metal surface. Colors now ready for production are copper, gold, blue, green and brown.

  For the decoration and protection of tanks, structural steel and metal buildings, the new formulations also include a line of alkyd based colored aluminum paints. Alcoa does not make aluminum paints or roof coatings but the new formulations are available to all paint manufacturers.

MANAGEMENT CLINIC



Conducted by ROBERT H. EMERICK, North Charleston, S. C.

Question—

WE SEEM to have an over-abundance of grievance cases, most of which go all the way to top management for settlement, and occasionally to outside arbitration.

Our manufacturing operations incorporate wood and metal shops, welders and electricians, and much of our trouble comes from internal friction over trade jurisdiction. For example, the machinists have been charged with doing work that belongs rightly to the pipe-fitters, and the pipe-fitters with encroaching on the welders.

Another form of complaint has to do with over-time. Individuals sometimes charge their supervisors with favoritism when assignments are made to overtime jobs.

Is there any suggestion you can make by which smoother industrial relations might be established? We have talked to other companies in our field, and they haven't been of much help.

Suggestion—

WE SUGGEST that you try holding a monthly meeting between representatives of the shops and a representative of top management.

This plan has worked wonderfully well with numerous companies. The shop representatives are called "shop committeemen" and are chosen by the employees in a popular election. The usual term of office is for one year, but the committeeman is subject to removal by his fellow employees at any time for cause.

The management representative sits as chairman of the meeting, and his responsibility is to discuss with the committeemen their various troubles and dissatisfactions. Obviously, the management man should possess a high level of personal authority, so that he may make decisions and solve many problems on the spot. Items on which additional information is needed, or which require attention at the topmost level, are recorded for later action and for report at the next meeting.

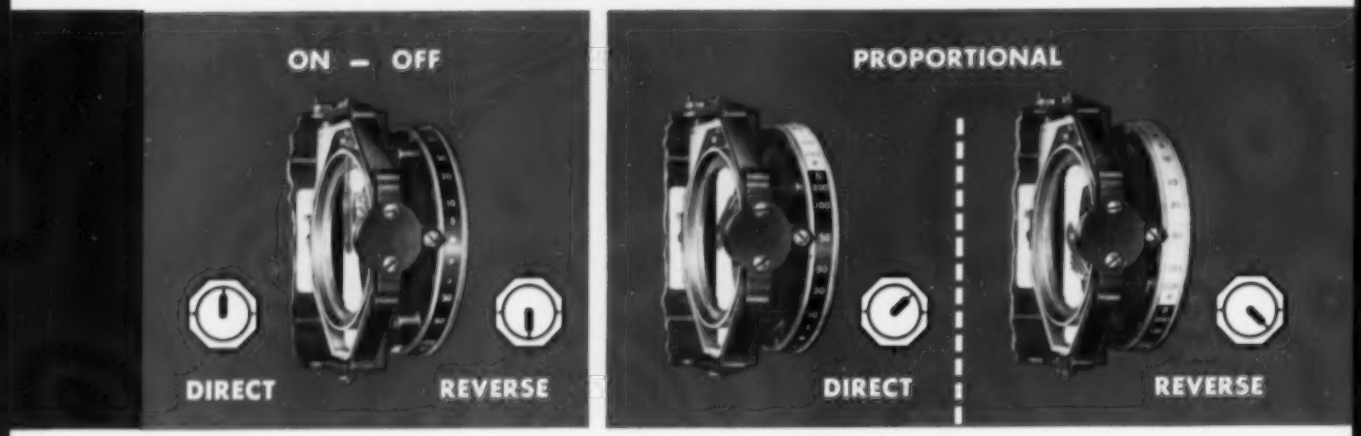
These shop committee-management meetings catch many situations that are potential grievance breeders, before acute conflict results. The general discussion, and the expression of opinions by committeemen who are not directly involved in a point at question, not only clarifies the situation but develops a strong tendency to smooth down ruffled feathers.

Another important power of these meetings is to destroy rumors, and in every organization of any size, rumors always are plentiful and many of them quite upsetting to employees. In fact a good way to open the meeting is for the Chairman to ask: *Who has any rumors to take up today?*

The strength of the shop committee-management talk depends on the frankness of both management and committeemen. The Chairman's attitude must be a "You're entitled to be kept informed of what affects you and the company," response to questions. The committeemen with equal frankness should tell the Chairman what the employees consider right and wrong.

A record of each meeting is kept, and copies forwarded as soon as possible, to each participant.

In the Versatile 60000 Series Controllers...



This is the Gimbal Unit that provides three types of control and direct or reverse action with one simple setting of the wheel. The wheel has knurled edge and large (3¾") diameter; carries its own scale which is divided into four quadrants marked for proportional or differential gap control

EXCLUSIVE MASONEILAN

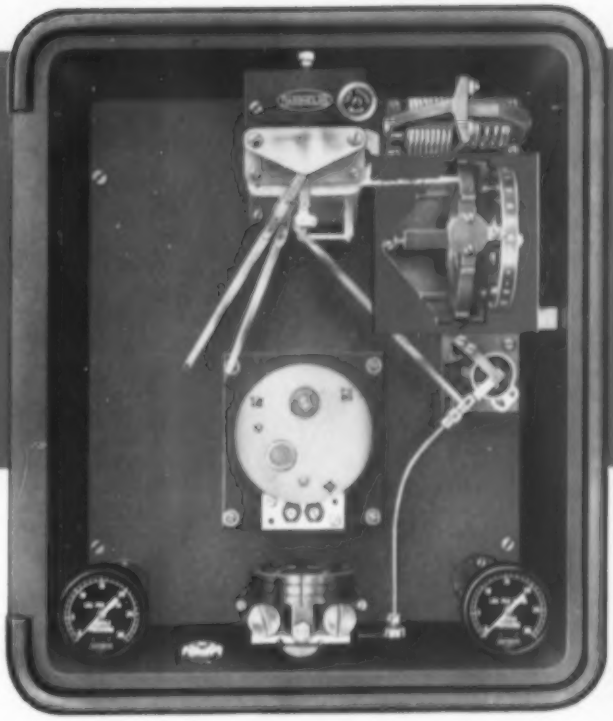
Selects Control Type and Action with One Simple Setting...

The Gimbal Unit is an outstanding example of Masoneilan design simplicity at work — combining primary and feedback motion in three ways to provide on-off, proportional, or differential gap control, each with direct or reverse action. One setting of the large diameter wheel selects type of control, action, and width of proportional band or differential gap — *simultaneously*.

Other examples of simplified design include:

- Standard, individually interchangeable unit sub-assemblies.

and direct or reverse action. Graduation intervals are widest at the lower end of the scales — 0 to 200% proportional band and 0-100% gap — permitting precise settings. Safety stops prevent accidental change of control type or reversal of action.



GIMBAL UNIT

- Manifolded air passages and plug-in pneumatic units, eliminating troublesome tubing and pressure fittings — easy accessibility.
- Proportional band, set point and reset rate settings accessible without disturbing chart.

The versatile 60000 Series instruments are available as recorders; indicating or recording controllers and receiver-controllers; or transmitters. Manual control sub-panel provides for manually controlling process during start-up; while aligning or testing the controller; while removing operational units from the controller, or the controller from the panel; and for switching from manual to automatic without process upset.

Before buying any pneumatic controller get the facts on the 60000 Series — most modern of its type — the instrument man's instrument. Ask for catalog and a demonstration.

MASON-NEILAN

Division of Worthington Corporation

35 NAHATAN STREET, NORWOOD, MASSACHUSETTS

SEVENTY-FIFTH ANNIVERSARY 75 1881 1956

Sales Offices or Distributors in the Following Cities:

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Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

Southern News Briefs

380,000 sq ft GE Texas Plant is Air Conditioned by GE Small Home Units

Over 300 3- and 5-ton capacity home cooling units constitute the air conditioning system for **General Electric Company's** new equipment manufacturing plant at **Tyler, Tex.** Heating for the 380,000 sq ft manufacturing center, including engineering laboratories and a two-story shop and office section, is furnished by small home-type GE gas-fired warm air furnaces and hot water boilers.

The unique heating and air conditioning system was designed by **Walter Kidde Constructors, Inc.,** New York, in conjunction with GE engineers. Purpose of the installation was two-fold: to achieve an efficient system for the plant itself, using GE home equipment actually manufactured at Tyler; and to obtain continuous testing of the equipment at extremes of temperature and humidity of Texas weather.

While the system may not be practical from a cost standpoint for the average plant, it makes excellent sense at Tyler. The equipment is available at manufactured cost and has additional value as test equipment from which continuous operating data may be drawn. Piping and auxiliary requirements, while different from those of a standard central system, are kept to a reasonable minimum by careful design.

Design Considerations — The task of heating and ventilating a large industrial building with small equipment, admittedly an unusual one, requires attention to best space utilization, shortest piping runs and best grouping of equipment.

First area to come under consideration was the 540 x 300 ft factory section. It was apparent from the beginning that a mezzanine or balcony location for the equipment was desirable, both to save space in the factory area and to make duct runs to overhead diffusers as short as possible. A parallel arrangement of air conditioning units was chosen,

View of balcony-located home air conditioning units. Balcony location was chosen to save space in the factory area and to shorten duct runs to overhead diffusers.

(Continued on Page 28)

ON THE LINE

IN 20 MINUTES

These two 25,000 kW Brown Boveri Gas Turbines using Bunker C oil as fuel, are in service in the Societa Salt Vehicarno System at Livorno, Italy.

BROWN BOVERI

GAS TURBINES

BROWN BOVERI large output gas turbines go into operation at full load *in 20 minutes or less* from a cold start. That's why they are so ideal for peak load service. Operating experience with Brown Boveri gas turbines shows a 25% *proven* efficiency (non-regenerative). . . a new standard for performance and economy.

First costs of gas turbine power plants are substantially lower than comparable conventional power plants. Further economies are realized in long life, low operating costs and low maintenance.

Discover how Brown Boveri large output gas turbines can solve your peak or base load problems. Write for the facts, today.

BROWN BOVERI CORPORATION

19 RECTOR STREET • NEW YORK 6, N. Y.

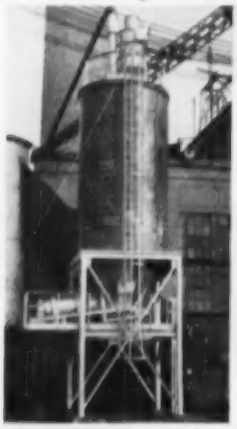
Atlanta, Ga. • Birmingham, Ala. • Boston, Mass. • Buffalo, N. Y. • Butte, Mont. • Chicago, Ill. • Cleveland, O. • Denver, Colo. • Detroit, Mich. • Hamilton, O. • High Point, N. C. • Houston, Tex. • Jacksonville, Fla. • Kansas City, Mo. • Knoxville, Tenn. • Lewiston, Me. • Miami, Fla. • Minneapolis, Minn. • New Orleans, La. • New York, N. Y. • Pasadena, Cal. • Portland, Ore. • Roanoke, Va. • San Francisco, Cal. • Seattle, Wash. • Syracuse, N. Y. • Tucson, Ariz.

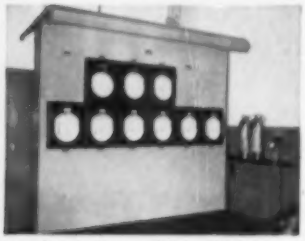
Power Plant Modernization at

Two 30 year old stoker fired boilers that were replaced.

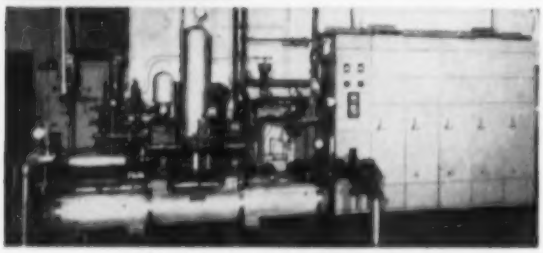
New Combustion Control Panel Board.

New Ash Storage Silo.





New Steam Flow Meter Panel Board.



Oil Heater and Load Center.

A survey of your plant by a consulting engineer could show ways of making surprising savings in your power costs.

Power MODERNIZATION PROGRAM

A 1956 POWER CITATION WINNER

Replacing two of six 6000 sq. ft. horizontal water tube boilers with

TWO 60,000 LBS/HR RILEY BOILERS Complete with Riley Coal/Oil Burners, Riley Pulverizers, Automatic Controls

give Thomas A. Edison, West Orange, N. J.

- **Doubled steam capacity per sq. ft.**
- **16% increase in boiler efficiency**
- **More flexible fuel selection**
- **A 20% annual return on net investment of 2.75 mills per Btu.**
- **A reduction in coal and stoker parts inventories**

Here again is a modernization program that proves conclusively that it pays to modernize . . . and with Riley boilers and fuel burning equipment. Because Thomas A. Edison Industries selected Riley equipment it was able to integrate both boiler and fuel burning equipment into a system that has produced outstanding savings, higher boiler efficiencies, higher fuel economies, lower maintenance and reduced operating expense.

The Riley RX Boiler is compact; with the exclusive single header hopper as an integral part of the furnace it provides ideal conditions for firing high ash coals and multiple fuels. The RX Boiler with single header hopper bottom is particularly recommended for installation in plants that will be firing coal at some future date.

RILEY

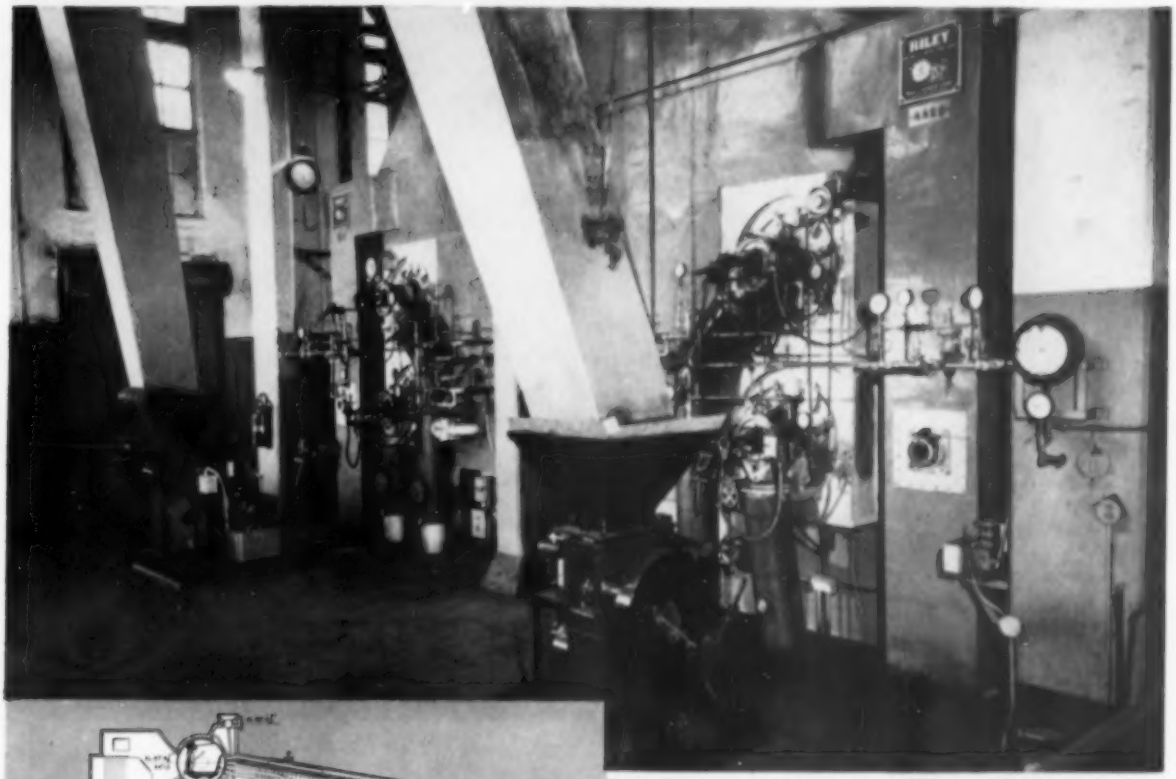
Stoker Corporation

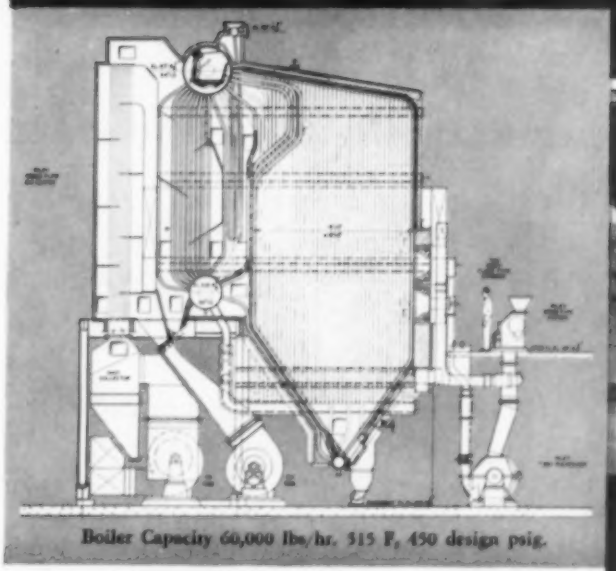
WORCESTER, MASSACHUSETTS

Sales Offices: Worcester, New York, Philadelphia, Buffalo, Pittsburgh, Cleveland, Detroit, Chicago, Cincinnati, Charlotte, New Orleans, Atlanta, St. Louis, Kansas City, St. Paul, Houston, Denver (Englewood), Salt Lake City, Los Angeles, San Francisco, Portland, Seattle.

Thomas A. Edison Industries

DIVISION OF McGRAW-EDISON COMPANY — WEST ORANGE, NEW JERSEY





Boiler Capacity 60,000 lbs./hr. 515 F, 450 design psig.

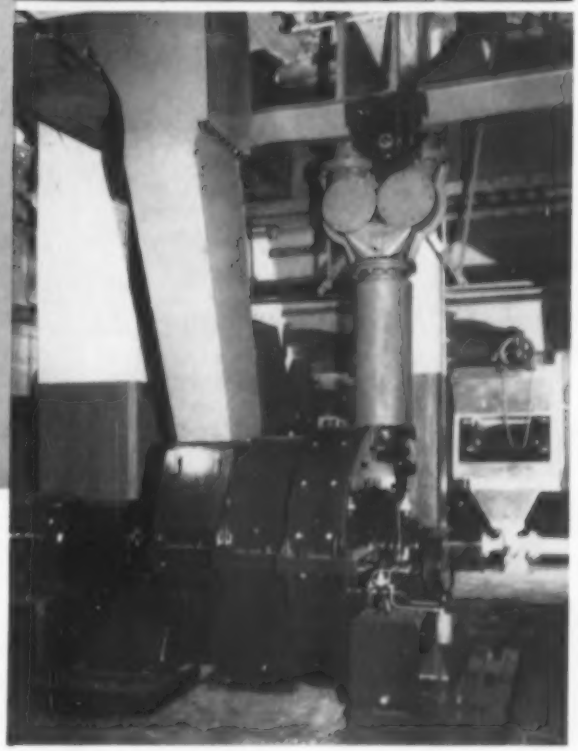
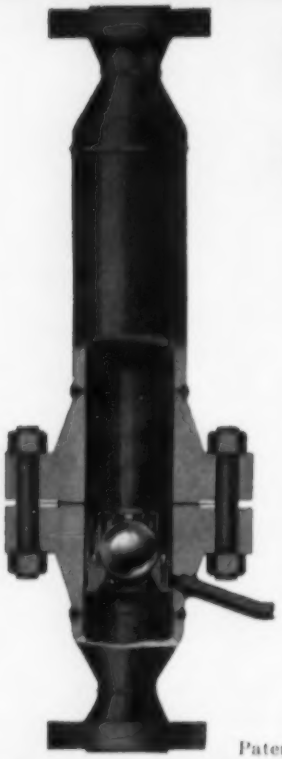


Photo above shows arrangement of Riley Coal/Oil Flare Type Burners in common secondary air duct. Two Riley Coal Feeders are in foreground.

At right is one of the two #350 Riley Pulverizers. This is the smaller size pulverizer particularly adapted for use in industrial installations. Its quietness and its vibrationless operation are two of its most unique and most desirable features. Tungsten carbide facing on pulverizing elements resists erosive effects of abrasives in high ash coals, reduces maintenance outages. Riley Pulverizers operate efficiently with the wettest coals.

For more information, use Reply Card—Page 119

C-V NEWS NOTES



Variable-orifice desuperheater for precise temperature control

Using a weighted steel ball for controlling the orifice opening, the new Copes-Vulcan Variable-Orifice Desuperheater assures close control of reduced steam temperatures regardless of load variations. Mixing and vaporization of cooling water and steam are so complete that reduced steam temperature can be held constant only 20 feet downstream from the desuperheater outlet — even over a 50-to-1 load range.

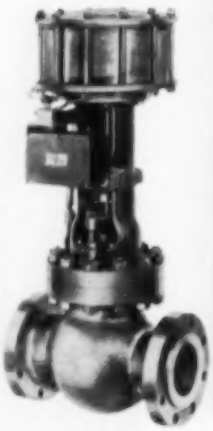
Unique design eliminates the need for excess piping, atomizing steam, spray nozzle or glands. No excess water needs to be removed from the stream.

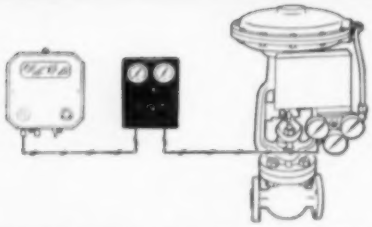
The Variable-Orifice Desuperheater is one of a complete line — each type engineered to meet particular operating conditions. Copes-Vulcan designs each station to meet individual requirements. Write for details.

Patent applied for

Two basic valves built to handle more jobs

With the new diaphragm-actuated Type CV-D and piston-actuated Type CV-P valves, Copes-Vulcan offers new simplicity in design, wider flexibility in application for remote control service. Type CV-D is reverse or direct acting in sizes up to 14-inch at unlimited pressures. Type CV-P is ideal for highest valve-operating force, and precise positioning. Write for Bulletin 1027.



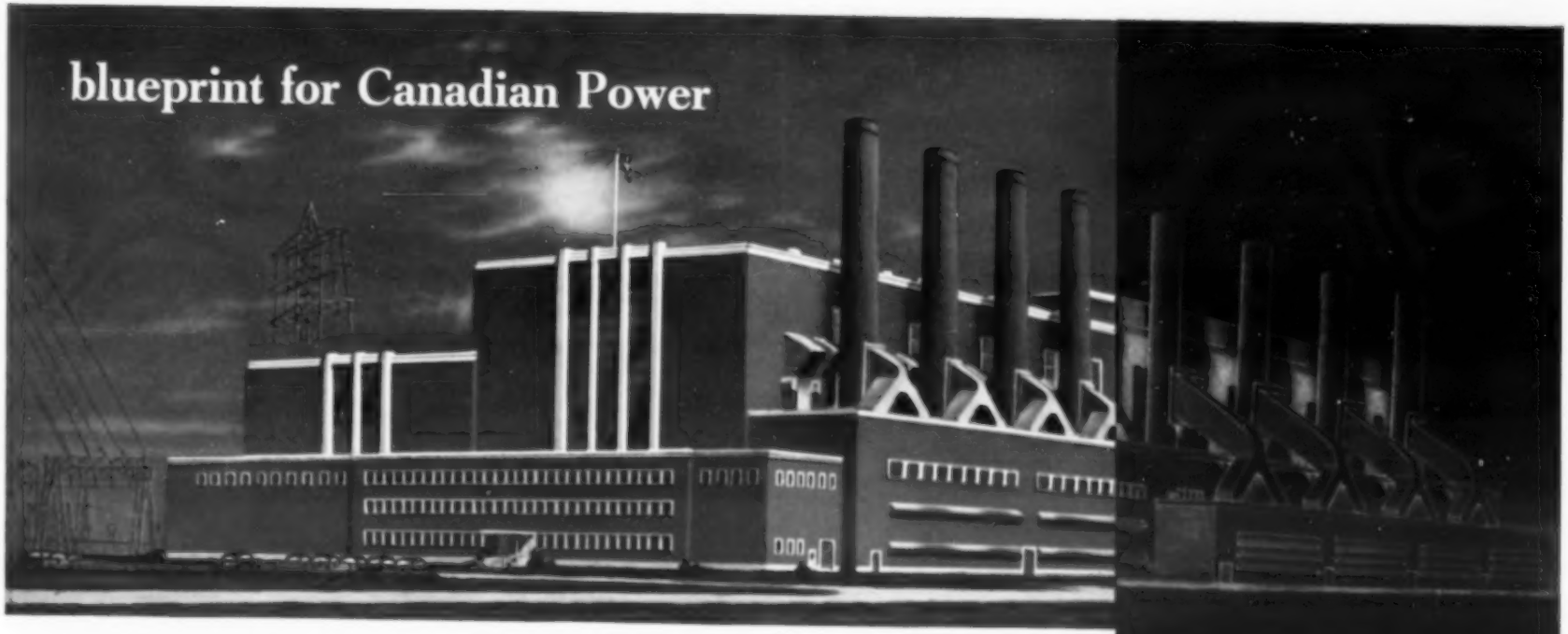


Pneumatic control stations simplify performance . . . maintenance

This Remote-Set AMS-4 Station is used with pneumatic stacked-diaphragm controllers . . . provides adjustable set-point loading or independent manual operation. Copes-Vulcan builds auto-manual stations in Standard, Remote-Set and Cascade types, and Manual Loading and Miniature Stations. Write for Bulletin 1031.

COPES-VULCAN DIVISION
BLAW-KNOX COMPANY
ERIE 4, PENNSYLVANIA

blueprint for Canadian Power



Ontario Hydro's Richard L. Hearn Generating Station in Toronto went on the line in 1951 with 100,000 kilowatts. By 1960 it will be generating 1,200,000 kilowatts . . . an average increase of over 100,000 kilowatts a year! When completed, the Hearn Station will be Canada's largest thermal generating facility.

The Hydro-Electric Power Commission of Ontario awarded the design and construction of the original unit and all subsequent additions to Stone & Webster.

In Canada, in the United States, all over the free world Stone & Webster Engineering Corporation and its affiliates are providing on-the-spot engineering services to many industries. And as a completely integrated organization Stone & Webster can handle a single engineering phase or take full responsibility for the completion of a major project including Design, Construction, Consulting Engineering, Reports, Appraisals and Examinations.

Write or call us for information as to how our experience may be of assistance to you.

1952 — Second 100,000 kw unit went on the line.

1953 — Two additional 100,000 kw units placed in operation.

1960 — Four 200,000 kw units scheduled for completion.

STONE & WEBSTER ENGINEERING CORPORATION

A SUBSIDIARY *of* STONE & WEBSTER, INC.

New York Boston Chicago Pittsburgh Houston Los Angeles San Francisco Seattle Toronto

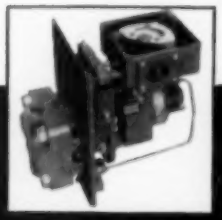
REPUBLIC'S new family of

NULL-BALANCE-VECTOR*

PNEUMATIC

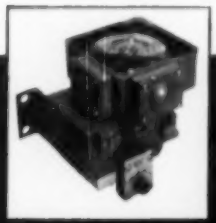
INSTRUMENTS

TYPE VP
Pressure Transmitter
Standard Ranges
0-1.5" to 0-5000 psi



TYPE VDP
Differential Transmitter
Standard Range
0-15 to 0-300" H_2O

TYPE VT
Temperature Transmitters
Standard Range
0-100° to 0-1000° F.



TYPE VC
Control Transmitters

* **Design principle which permits making extremely accurate and sensitive components that are compact, versatile and interchangeable.**

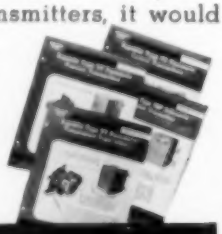
Republic's new line of pneumatic instruments includes pressure, differential pressure, temperature and control transmitters. Controllers that feature repeatable reset rate, less than 0.05% dead band and proportional band adjustment from 2 to 500%;—differential pressure transmitters with 20 to 1 range adjustment;—pressure transmitters of ±0.5% accuracy; and temperature transmitters with 10 to 1 range adjustment show the flexibility as well as the compactness, lightweight and accessibility of these instruments.

THE NULL-BALANCE-VECTOR PRINCIPLE

In terms of calibration, the null-balance-vector principle means that the span of any pneumatic instrument in the line can be varied at will . . . merely use a screwdriver and a reference . . . without re-setting zero. In terms of theory, the null-balance-vector principle means that the proportion of an input force (from a measuring bellows, bourdon tube, diaphragm, etc.) balanced by the pneumatic circuit can be varied by changing the angle at which that force acts on other links in the system. Hence, without changing air supply pressure or the measuring bellows, bourdon tube or diaphragm, the same output signal pressure range can reflect a measured input signal range that can be changed as much as 20-to-1.

Republic's new family of pneumatic instruments was developed in parallel programs that use the greatest possible number of common components. The result: High interchangeability of parts, even between instruments performing entirely different functions. Such design foresight has made the spare parts and training problems extremely simple. And Republic's null-balance-vector design means that full-range operation involves virtually no motion . . . and virtually no wear.

If you want the best sensitivity, accuracy and reliability in pneumatic transmitters, it would pay you to get full details on all four of Republic's new family of Null-Balance-Vector Pneumatic Instruments. Write for descriptive folios on each type, now.



REPUBLIC FLOW METERS CO.
A Subsidiary of Rockwell Manufacturing Company
2240 Diversey Parkway • Chicago 47, Illinois

A Small Plant Modernizes with DETROIT STOKER

PIERCE·ROBERTS RUBBER CO·
TRENTON 6·NEW JERSEY

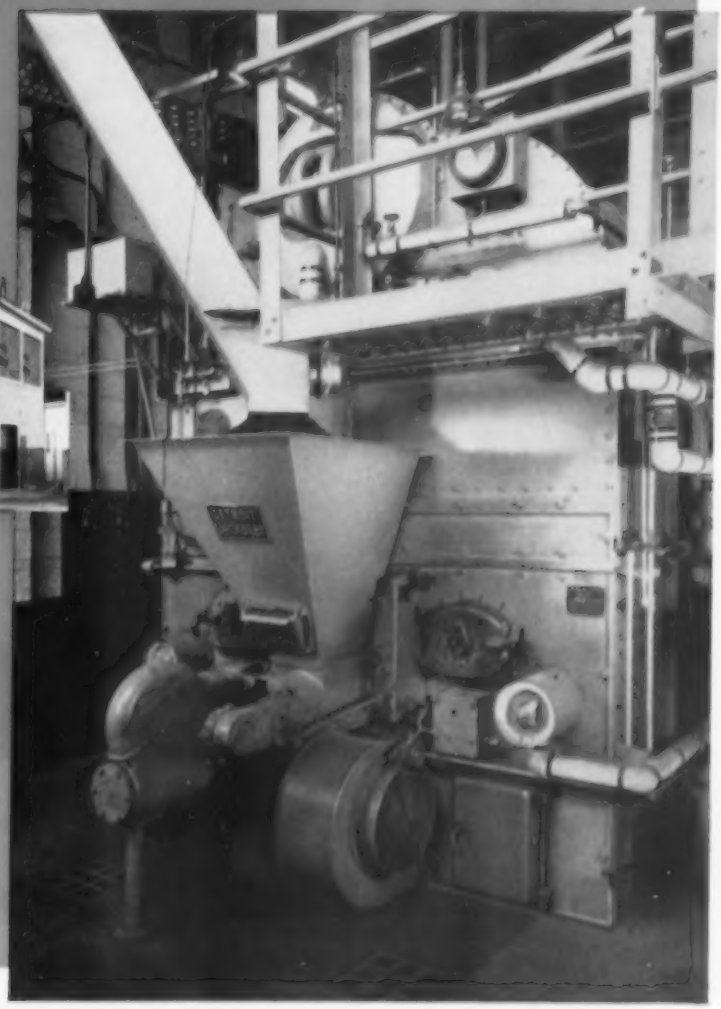
You don't have to have a giant plant to benefit from modernization, high efficiency and dependability of Detroit Stokers.

Here is a thoroughly up-to-date plant. Boiler, stoker, coal handling and storage, and ash handling are all modern, mechanized, efficient and clean.

A Detroit UniStoker fires a 200 horse power Keeler Type CP Boiler. Coal is automatically delivered to the stoker from a silo. Ashes are mechanically removed and stored. *No shoveling—no dirt.* Boiler operates up to 175% of normal rating at 125 p.s.i.

For large or small plants, Detroit Stokers provide modern, economical and dependable operation.

PENNELL & WILTBERGER
Consulting Engineers
Philadelphia



DETROIT SINCE 1898 STOKERS

DETROIT STOKER COMPANY

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District Offices or Representatives in Principal Cities

In Iron Body Wedge Gate Valves,
Outside Screw and Yoke Design,

Walworth offers you these 8 outstanding advantages!

STRONGER CONNECTIONS. T-head disc-to-stem connection on OS&Y types permits wedge to properly seat itself.

TIGHTER SEAL. Solid web type disc on OS&Y valves provides tight closure, greater strength and longer service.

REDUCED TURBULENCE. Fluid action is minimized due to this straight-flow port design.

FEWER OBSTRUCTIONS. Seat rings of bottom-seated types are screwed into body to prevent gum and grit accumulations.

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Walworth Subsidiaries: ALLOY STEEL PRODUCTS CO. · CONOFLOW CORPORATION · GROVE VALVE AND REGULATOR CO.

SURE-GRIP HANDWHEEL. Fluted design assures a sure grip, even with greasy gloves.

HIGH CORROSION RESISTANCE. Brass liner protects glands from deterioration and scoring.

EASIER REPACKING. Hinged gland eye-bolts on OS&Y valves permit fast maintenance under full pressure.

LESS DAMAGE. Bronze back-seat bushing in bonnet of OS&Y valves prevents scoring, guides stem accurately.

Walworth Iron Body Gate Valves are available with screwed or flanged ends, in sizes and types for every purpose. For full information see your Walworth Distributor or write: *Walworth Company, 60 East 42nd Street, New York 17, N. Y.*

WALWORTH*

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M & H VALVE & FITTINGS CO. · SOUTHWEST FABRICATING AND WELDING CO., INC. · WALWORTH COMPANY OF CANADA, LTD.

Now You Can Specify an Armco Pipe to

Meet any Sewer Requirement

For Highest Flow Capacity

Armco SMOOTH-FLO Sewer Pipe with a special bituminous lining that fills and covers the strength-giving corrugations. Provides a smooth, efficient interior.

For Corrosion Resistance

Various types of Armco Pipe provide the material durability you need. Plain galvanized for normal service, asphalt coated for added protection, and for the most severe corrosion service you can get the protection of Armco ASBESTOS-BONDED®. This has a layer of asbestos fibers embedded into the zinc coating and sealed with a special saturant.

For Erosion Resistance

Armco PAVED-INVERT® Pipe with a tough bituminous pavement in the lower quarter—where the wear is most severe. This provides balanced design for extra service life.

For Strength and Waterway Area

You can specify exactly what you need from the wide range of gages and sizes of Armco Corrugated Metal Pipe.

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Armco Sewer Structures have been proved in severe industrial service

ARMCO DRAINAGE & METAL PRODUCTS, INC.

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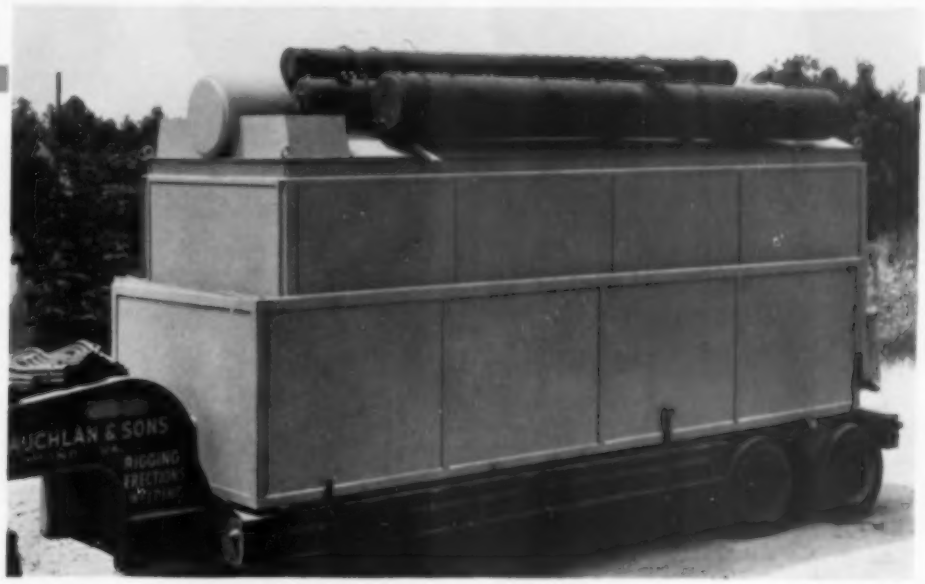
Other Offices In Principal Cities

ARMCO SEWER PIPE

ARMCO®

"Knocked-Down" delivery of Queen City Boiler to Richmond's Hotel Raleigh!



Two Queen City Boilers loaded for delivery . . . a "Knocked-down" 115 hp boiler for Hotel Raleigh, Richmond, Va., and a completely assembled 300 hp boiler for Imperial Tobacco Co., Norfolk, Va. Boiler installations by E. McLauchlan & Sons, Richmond, Va.

Queen City water tube Boiler assembled inside the hotel boiler room!

How can replacement boilers be installed in practically inaccessible areas?

That's easy if they're Queen City Boilers! Simply order your QC Boiler delivered "Knocked-down" . . . and assembled inside the boiler room.

The complete size range of QC Boilers can be installed in "hard-to-get-at" areas without costly building alteration and without danger to the building or its occupants.

You save money because no building construction or reconstruction is normally required.

And with a Queen City, you'll get more steam, faster and drier, for less cost.

No matter what the fuel . . . oil, gas, coal, combination gas-oil . . . install a QC water tube Boiler in your plant for greater all-round efficiency.

Queen City Boilers are available from 300-17,500 lbs/steam/hr, up to 250 psi, with reserve steam "built-in"!

Queen City water tube Boilers have "built-in" reserve steam!

Highly efficient
QUEEN CITY WATER TUBE BOILERS
are saving money **right now** for many plants in many industries!

For complete information, write

Queen City Engineering Co.

P. O. Box 3103 CHARLOTTE • NORTH CAROLINA

A blue chip pump...

ALABAMA POWER COMPANY
Birmingham, Alabama

ARIZONA PUBLIC SERVICE COMPANY
Phoenix, Arizona

ATLANTIC CITY ELECTRIC COMPANY
Atlantic City, New Jersey

CALIFORNIA ELECTRIC POWER COMPANY
Riverside, California

CINCINNATI GAS & ELECTRIC COMPANY
Cincinnati, Ohio

COLUMBUS & SOUTHERN OHIO ELECTRIC COMPANY
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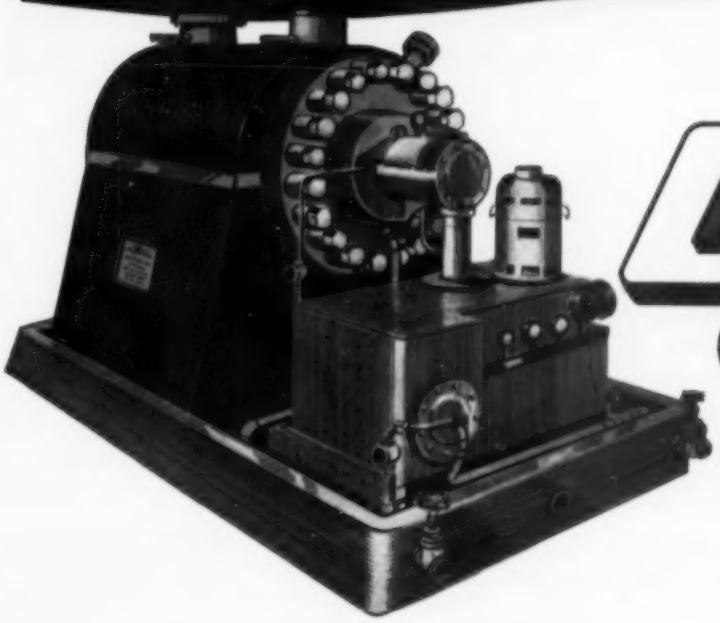
PACIFIC Boiler Feed Pumps



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Metallizing Engineering Co., Inc.

Sells industry

No one is in a better position to give a hard-boiled, practical answer to this question than the men who spend their working lives on the sales front . . . the men the ads are supposed to help . . . the men who sell.

Here is the statement of a salesman who knows what advertising does for him when it appears in the industrial, trade or professional publications that serve the specialized market to which he sells:

Says Mr. Kistenberger:

"I happen to know that better than 50% of my sales to new companies can be traced to leads from our business paper advertising. Another 25% of my sales to new owners I close after following up leads that can't be traced directly to our advertising, but I know darn well that that's where they come from because that's about the only place they could learn about our metallizing systems.

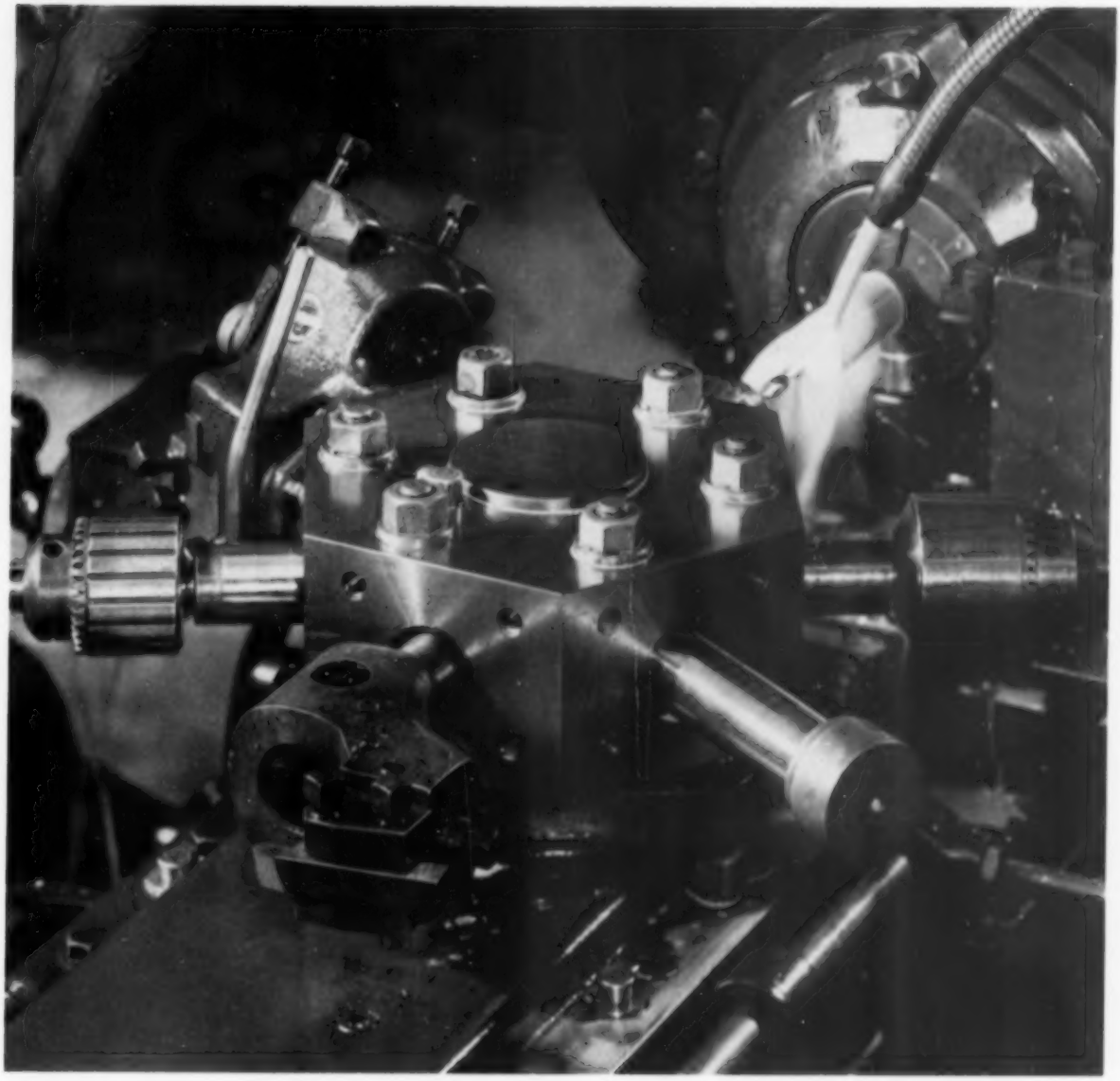
"It's been my experience that our trade advertising is getting to the right people. In many cases this man is an executive who is hard to see on a cold call. But he's a guy that will take the time and trouble to read and he's just the one to drum up interest in metallizing down the line in his company. In other words, you get more action if the suggestion comes down to the production department or the plant engineer from this executive. Of course, I don't mean to say that people will just read about a product like ours and instruct someone to write out an order. It's not that simple. But they do know about metallizing from our advertising and sometimes a surprising amount. That was particularly true of our new ceramic spraying equipment which was introduced last year and which got us into fields we'd never been in before. I think that getting a new product known is usually a pretty tough job but the leads our advertising got us were a big help in reaching the right people."

Why not ask your own salesmen what your company's business publication advertising does for them. If their answers are generally favorable you can be sure that your business publication advertising is really helping them sell. If too many answers are negative it could well pay you to review your advertising objectives — and to make sure the publications that carry your advertising are read by the men who must be sold.

Southern Power & Industry

NBP

One of the 207 members of National Business Publications, Inc. . . . each of which serves a specialized market in a specific industry, trade or profession.



The Drops that Up Production!

In cutting oils it's the quality *each drop* delivers, not the quantity used, that ups production. Backed by the largest combined petroleum research and testing facilities in the world Standard Oil Cutting Oils are designed and refined to help secure improved finish and closer tolerances while giving tools a cushion against shock and a protection against wear in cutting, drilling, reaming and tapping operations.

The cooling effect of these oils is brought to a level that makes high speed work possible without machine damage. Rigid controls insure that every drop of Standard Oil Cutting Oils contains a full measure of these characteristics.

STANDARD OIL LUBRICANTS

STANDARD OIL COMPANY (Kentucky)

since condenser water, drains, electricity, and fresh air supply could be run in straight lines between equipment. For specified factory temperatures (78° summer, 70° winter), diffuser spacing worked out to be approximately 30 x 20 ft, based on capacity of the 5-ton cooling units.

Since one row of cooling units contained approximately one-fourth the total cooling capacity required for the factory, a three-mezzanine arrangement was chosen, the center mezzanine containing parallel rows of coolers on both sides. Mezzanine height is 25 ft above the floor. The general arrangement is a row of four cooling units, a GE gas-fired warm air furnace and another line of four cooling units. This worked out well both from the standpoint of shortest ductwork runs to diffusers and best spacing of the furnaces, which required diffusers on 60 ft centers for winter heating.

Both air cooled and water cooled air conditioners are used in the factory area. The GE water cooled air conditioners contain an integral fan, coil, compressor and condenser. Air cooled units are two-section equipment, containing an integral fan and coil section and an air cooled condenser and compressor unit.

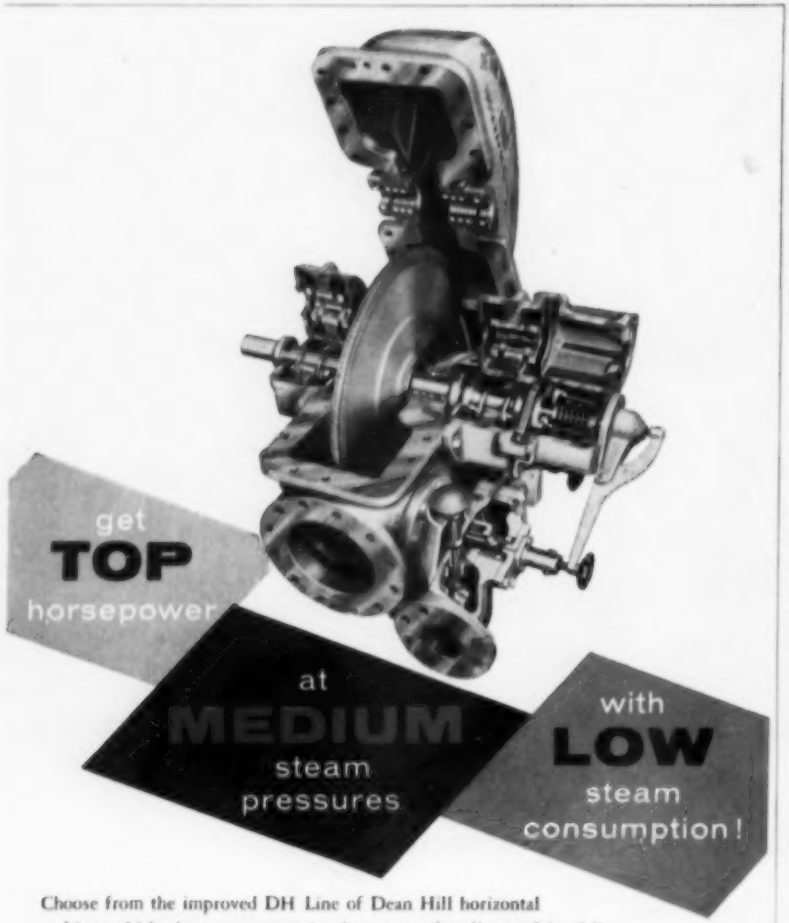
In both cases fans are controlled manually or automatically in groups. Room thermostats throughout the factory area control the compressors of groups of cooling units for summer operation. During winter the fans will be operated manually for ventilation.

Center mezzanine coolers are recirculating units only, while coolers on the east and west wall balconies are combination recirculating and fresh air units, receiving outside air from four heating and ventilating units, two on each balcony. Groups of three GE gas-fired steam boilers, 345,000 Btu output capacity each, feed into a common header and supply steam to each heating and ventilating unit. The combination of units and steam boilers supplies 74,000 cfm of fresh air (70 F in winter, ambient in summer) to the air conditioning units. Manual dampers at each supply air connection allow the units to be balanced against each other for fresh air quantity.

Office and Laboratories — Coolers and gas-fired furnaces serving office and laboratory sections of the building are grouped in equipment rooms on the first and second floors. Primary reasons for the arrangement are flexibility and ease of maintenance.

Whether appliances were grouped centrally or located in using areas, total system piping and ductwork would have been approximately the same. In one case ductwork would have been decreased but services to the equipment would have been greatly increased. In the present arrangement services (condenser water, drains, electricity, fresh air, etc.) are centralized but ductwork is more extensive. However, the present system has the advantage of centralizing all maintenance and inspection of equipment. Equally important, future movement or subdivision of office and laboratory space will involve only a change in ductwork and not in service piping and appliances.

All office and laboratory system cooling units are water cooled units,



Choose from the improved DH Line of Dean Hill horizontal turbines which give you up to twice the power of earlier models while maintaining the same economy of operation.

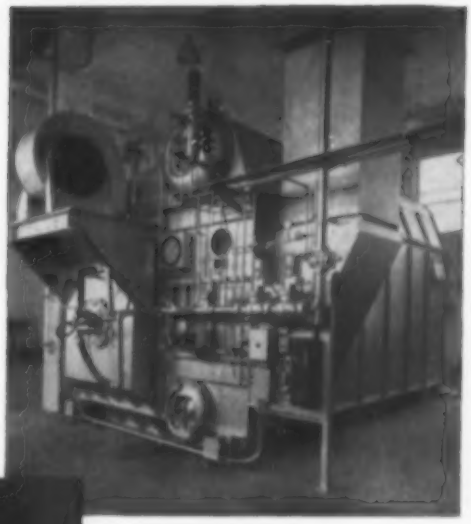
The major change contributing to this tremendous power increase is the addition of steam nozzles to all models. On types now built with two nozzles—DH-10, DH-15, DH-20, DH-25—this change has meant *a 100% increase in the maximum horsepower of each unit!* On new three-nozzle models—DH-30, DH-35, DH-40, DH-45—the rated increase in maximum horsepower is 50%!

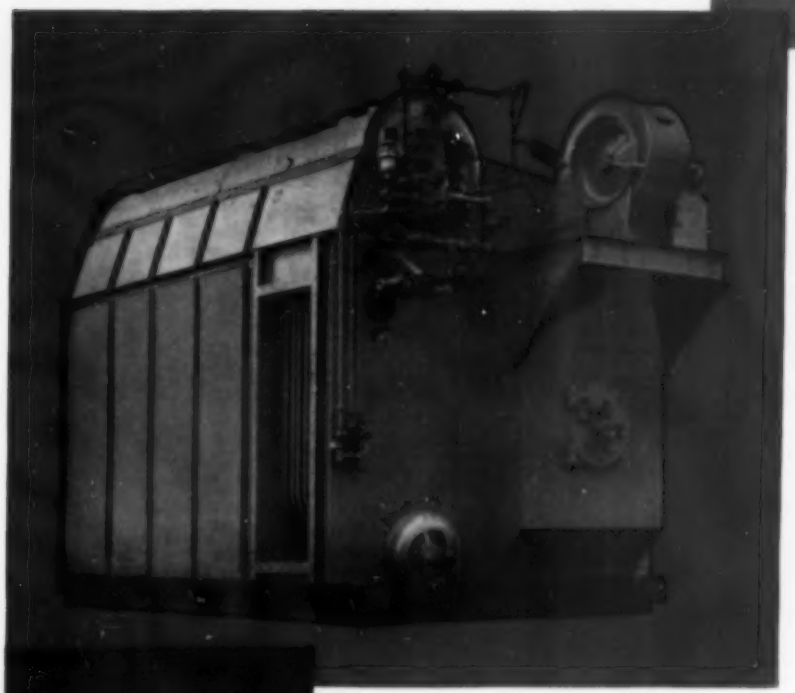
Why not get the complete power picture of Dean Hill's improved DH Line of horizontal turbines? Write today for Turbine Catalog, No. 500.

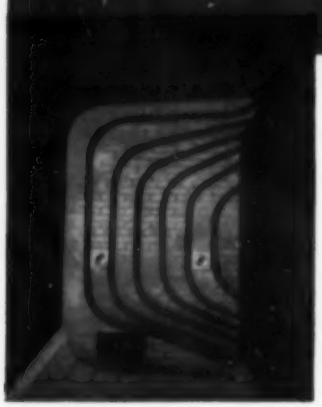
DEAN HILL PUMP COMPANY
Pump and Turbine Engineers Since 1893
Indianapolis 7, Indiana

OFFICES IN PRINCIPAL CITIES

packaged power for limited space requirements . . .







KEELER

Type D-K

a comparatively wide and short boiler incorporating the proven efficiency and economy of Keeler Water Tube Steam Generators in a compact, low cost unit

Where boiler room space is definitely limited, the KEELER TYPE D-K Water Tube Package Steam Generator is the answer to your problem! It's a comparatively wide and short boiler for use where long boilers of other types cannot be accommodated.

KEELER TYPE D-K Package Boilers are made in oil or gas fired units with capacities from 8000 to 45000-lbs. of steam per hour—standard design pressures of 200 psi and maximum design pressures of 500 psi. The furnace sides, roof and floor, as well as front and rear walls, are water cooled and insulated. The complete "package", ready for quick hook-up and operation, includes all burning equipment, controls, safety devices and accessories.

For a low first cost, low operating cost outfit, you'll want the full particulars on this compact Package Power Plant! Write or phone . . . there's a KEELER representative at your service in your locality.

Write For Bulletins

No. DK-1: Type DK Package Boilers
No. F-14: Type CP Package Boilers
No. M-2A: Type CPM Package Boilers
No. MK-1: Type MK Boilers

The Seal of Quality in Water Tube Boilers

— ESTABLISHED 1864 —

E. KEELER CO.

West & Church Sts. • WILLIAMSPORT, PA.

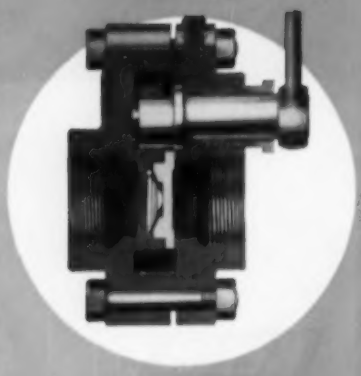
– OFFICES IN PRINCIPAL CITIES –

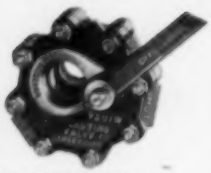
KEELER WATER TUBE *Boilers*

For more information, use Reply Card—Page 119

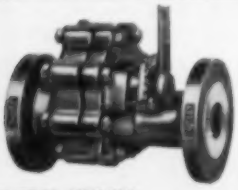
Everlasting Valves

are superior for many services





BOILER BLOW-OFF
Quick acting, also handwheel operated "Y" and angle types. For pressures up to 600 psi.



GENERAL SERVICE
Where drop-tight seal and full flow is essential.

CYLINDER OPERATED
Can be remotely controlled, electrically or manually.

STEAM JACKETED
Assures free flow of viscous materials.

WEIGHT-OPERATED
For automatic drains or emergency shut off.

When you want

- quick action
- drop-tight seal
- minimum pressure drop
- straight-through full flow
- self-grinding rotating disc
- valves that cannot wedge or jam

then you want an Everlasting Valve

No other valve has all the Everlasting features . . . proven by half a century of service to assure dependable, leak-tight service.

LET US HELP YOU WITH YOUR VALVE PROBLEMS

EVERLASTING Valves

EVERLASTING VALVE CO.
53 FISK STREET, JERSEY CITY 5, N. J.

EV-952

News (Continued)

each with a supply duct and ceiling diffusers. The coolers function as combination recirculating and fresh air units, receiving outside air from two centrally located heating and ventilating units. The equipment rooms which house the cooling units are used as plenum chambers, the air conditioning units picking up the return air from the plenum.

Offices Use Air Wall System — Air conditioning of the executive offices and the building lobby is supplemented by the GE Air Wall system, consisting of a combination water cooled air conditioning unit and gas-fired warm air furnace. The combination unit has a heating and cooling thermostat which controls the gas burner on the furnace and the compressor on the cooling unit.

System Services — The plant condenser water system is primarily designed to supply condenser water for the package air conditioning units, although it is also used to supply water to other equipment in the factory and laboratory areas. The system consists of a two cell cooling tower (designed to cool 3600 gpm of 105 F water to 85 F with a 78 F wet bulb temperature), four condenser water circulating pumps, three operating and one standby. Each pump is sized to circulate 1200 gpm through the system.

Water is piped from the compressor building, where the pumps are housed, via a bridge over the roadway, to the plant, where it is distributed to equipment and back to the cooling tower. In the factory area plugged outlets on 60 ft centers are provided in the supply and return mains to allow flexibility in the system for condenser water requirements. City water is provided to the cooling tower through a float-operated make up valve to compensate for drift and evaporation losses.

Four air compressors, capacity 340 scfm at 100 psig, and auxiliary equipment are installed in the separate compressor building, with provisionary space for four additional compressors with individual after coolers. The system supplies compressed air at 100 and 400 psi and at minus 40 F dewpoint to the factory and laboratories.

Separate fuel oil and butane storage and distribution systems have been provided to supply oil and gas to the engineering laboratory for testing purposes.

Process Air Conditioning—Process

(*Continued on Page* 34)

EUTECTIC Welding News

Low Temperature EUTECTIC WELDING ALLOYS

PLANT, RESEARCH LABORATORIES and WORLD HEADQUARTERS

Published by EUTECTIC WELDING ALLOYS CORPORATION 40-40 172nd STREET FLUSHING 58, NEW YORK N. Y.

"EUTECTIC" WELDING HEADLINES • TIME-MONEY-MACHINERY SAVERS

OVERLAY TECHNIQUE SAVES $2000

Photo shows hammer heads in various stages. Far left shows new hammer. Others show cracking and peeling to different degrees. These were overlayed with ordinary materials.

Overlaying worn crusher hammers with conventional welding materials proved costly to a Minnesota brick plant. Overlays failed in less than a week, repair costs mounted.

The Eutectic District Engineer advised that high heat needed to apply the conventional materials actually weakened the overlay. The answer was to use as low amperage as possible.

Tests were run on hammers rebuilt in this way: First, hammer faces were padded with EutecTrode 680 AC-DC. This very high strength alloy, applied at very low amperage, acts as a cushion for the overlay. Next, EutecTrode 10 for super high hardness (RC 64-68) was applied over the padding layer, giving maximum abrasion resistance. For added protection against severe pounding. EutecTrode 12 was applied to corners.

At the start of the test, all hammers weighed 21½ pounds. After two weeks hammers with conventional overlays were down to 16¾ pounds. Six weeks later hammers with Eutectic repaired overlays were still 18¾ pounds. Repairs, reports the company, which once cost $690 every six weeks, were now reduced to $369... savings close to $2,000 a year... almost 50%. Now, hammers need attention only every six weeks rather than every week... and downtime has been cut by 84%. *(B-13)*

EXTRUDED COATING SOLVES ALUMINUM WELD PROBLEM

Welds on aluminum tanks were cracking right down the middle. Difficulty was caused by the uneven flow of flux, common when flux is put on rod by old fashioned dipping. Eutectic's Low Amp EutecTrode 2101, with *extruded* "frigid arc" flux coating was used. Because of smooth, even, *extruded* application of flux to rod, it is spatter-proof and easy to control. EutecTrode 2101 is strong, too—with an ultimate tensile strength of 34,000 psi to make joints up to three times stronger than those obtained with conventional welding materials. Tank fabricator reports cracking problems solved... production increased by 40%. *(B-14)*

CONCRETE FORM'S INTERIOR BRACING WELDED WITH SUPER-STEELTECTIC 110

An Illinois welding shop received an order for six concrete septic tank forms. Welds on this job were in all positions, and interior bracing consisted of heavy angles set against sheet steel. Using conventional mild steel electrodes, weldors soon ran into difficulty. Many angles and braces made the arc hard to maintain, and the deposit could not be properly controlled for the strong welds needed.

Super-SteelTectic 110, a new universal, all position EutecTrode was suggested by the Eutectic District Engineer. The highly exact control of penetration possible with this alloyed steel electrode gives excellent results on joints of varying thicknesses. The lower amperage minimizes danger of burn through, and eliminates spatter. Welds are exceptionally strong, too, as Super-SteelTectic 110 deposits weld metal near 110,000 psi tensile. *(B-15)*

Q. We have a bulldozer drive shaft, 3⅛ inches in diameter, that sheared in half. What repair procedure is recommended?

A. Vee the shaft out on either side of the break and clean thoroughly. A square butt joint is not recommended. High strength patented EutecRod 16FC, 3/16-in diameter should be used together with Eutector 16B Flux, which is painted on prior to heating. Joint should be designed with a gap to insure deposited metal throughout.

Q. Our flux for stainless steel brazing breaks down at about 1700°F. What can you recommend?

A. The "Eutector" series of T (Triple Strength) fluxes is designed for applications requiring sustained heating cycles or higher temperatures than are normally used in silver brazing. Consequently, the T fluxes are suitable for temperatures up to approximately 2000°F.

Q. In production of surgical instruments we have been using a conventional silver alloy that tarnishes badly. Require a thin flowing silver alloy of the same melting temperature that will retain luster.

A. EutecRod 1800 is free of cadmium, the element most responsible for tarnishing. Bonding temperature is approximately 1100°F. EutecRod 1800 is of the eutectic-type, having a narrow plastic range, and noted for its thin flowing properties.

Eutectic Warehouse—Service Centers
446 Northside Drive, N. W., Atlanta 18, Ga.
2204 Irving Boulevard, Dallas 7, Texas

Eutectic Welding Alloys Corporation
40-40 172nd Street, Flushing 58, N.Y.

Gentlemen:

I would like further free information on the following:

☐ B-13 ☐ B-14 ☐ B-15

☐ Free: New 1958 180 page pocket Welding Data Book.

Name _____

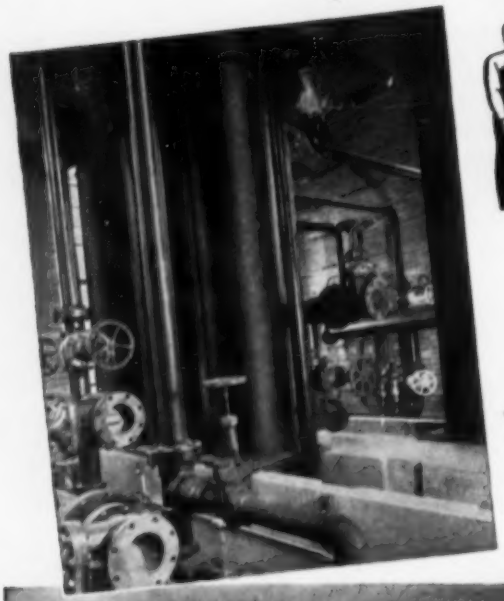
Business Address _____

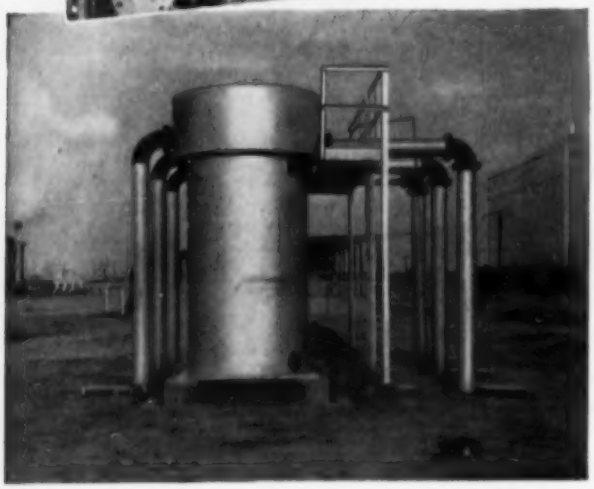
City _____ State _____

EUTECTIC WAREHOUSE—SERVICE CENTER • 446 NORTHSIDE DRIVE, N.W., ATLANTA 18, GA.
EUTECTIC WAREHOUSE—SERVICE CENTER • 2204 IRVING BOULEVARD, DALLAS 7, TEXAS

Dirty Water can't "Shut-down"...

Vogt





film type exchangers

(Condensers—Coolers—Evaporators)

Patent Nos. 1,935,270 - 2,057,597 - 2,424,441

River water, well water or brackish water are all alike to this exchanger *because it can be cleaned* while in operation! The water distributing ferrules need only be removed successively for the cleaning brush or tool whereby the tubes receive additional water which sluices away the dislodged dirt.

Vogt Film Type Exchangers are operating with real economy of first cost, operation and maintenance in power, petroleum, and chemical industries. They serve as Jacket Water Coolers, Feed Water Heaters, Hydrocarbon Evaporators, Sulphuric Acid Coolers, and Sulphur Dioxide Condensers, and can be designed to cool or heat any liquid and to condense or evaporate any fluid.

TOP: *Four units at Newton Falls, Ohio Municipal plant cool water for diesel engines and a lubricating oil cooler.*

BOTTOM: *Jacket Water Coolers serving engines of 7,300 HP in the compression plant of a Western Oil Refinery.*

[Bulletin HE-7 describes typical installations of Vogt Film Type exchangers and is available upon request. Dept. 24A-XS.]

HENRY VOGT MACHINE CO., LOUISVILLE, KY.

Sales Offices: NEW YORK, CHICAGO, CLEVELAND, DALLAS, PHILADELPHIA, ST. LOUIS, CHARLESTON, W. VA., CINCINNATI

Values You Can't Specify

You Get Them in MIDWEST PIPING

In the fabrication and erection of every high pressure and/or high temperature piping installation, there are intangibles important to the success of the job . . . things that cannot be spelled out in the specifications but are essential to getting superior piping at an economical price.

Important among these is the experience of the fabricating and construction organization . . . experience on all kinds of projects so that the possibilities and limitations of all piping materials are well understood. Midwest has fabricated and erected the piping on many critical jobs . . . including numerous atomic energy projects and Kyger Creek (the largest steam power plant ever handled completely by one piping contractor).

Another is a questioning attitude . . . a frame of mind that habitually asks (before the job is placed in the shop for fabrication): "Have the pre-fabricated sub-assemblies been so planned that the field work is minimized and simplified as much as possible?" Highly skilled Midwest piping engineers carefully analyze every job with this question in mind.

For power plant or process, the customer gets the most for his money when he buys Midwest Piping.

Main steam piping at Kyger Creek Plant which has a capacity of 1,075,000 kw and is the largest power plant piping contract (combining fabrication and erection) ever performed by a single contractor.

MIDWEST PIPING COMPANY, INC.

Main Office: 1450 South Second St., St. Louis 4, Mo.

PLANTS: ST. LOUIS, CLIFTON, N. J. and LOS ANGELES

SALES OFFICES:

ASHEVILLE (BOX 446, SKYLAND, N. C.) • BOSTON 27—426 FIRST ST.
CHICAGO 3—79 WEST MONROE ST. • CLEVELAND 14—616 ST. CLAIR AVE.
HOUSTON 2—1213 CAPITOL AVE. • LOS ANGELES 33—520 ANDERSON ST.
MIAMI 34—2103 LE JEUNE RD. • NEW YORK 7—50 CHURCH ST.
ONEIDA, N.Y.—282 NORTH MAIN ST. • SAN FRANCISCO 11—420 MARKET ST.

7670

MIDWEST PIPING FABRICATION AND CONSTRUCTION

Offer you many advantages

News for the South & Southwest (Contd)

(Texas Plant — Continued)

air conditioning is necessary during certain stages of the equipment manufacturing process. A Kathabar unit using lithium chloride as the absorbing agent is used with and without a refrigeration cycle, depending upon the process. The chemical regenerator uses steam from gas-fired GE steam boilers; the boilers also supply steam to the pre-heating coils. Cooling for the air is accomplished with direct expansion coils. Where refrigeration is required the coils operate in conjunction with a duplex refrigeration compressor and water cooled condenser. The compressor, which has four steps of unloading, operates on suction pressure and is interlocked with the condenser water system through a differential pressure control.

Lincoln Electric Offices

Robert C. Eckert has joined **Lincoln Electric Company's** district office at Baltimore and **Kirk H. Sterling** the office in Charlotte, N. C.

McQuay—Arkansas

G. G. Workinger, General Sales Manager of **McQuay Inc.**, Minneapolis, has announced the appointment of **Richard S. Vinsant**, 73 Broadmoor Drive, Little Rock, Arkansas, as their representative for heating and air conditioning products in the Arkansas territory.

Mr. Vinsant was formerly associated with Hurston-Conaway Company, the McQuay representative in Memphis, Tennessee.

Chain Belt—Atlanta

John P. Calhoun recently joined Chain Belt Company's Atlanta, Georgia office as District Sales Engineer, according to **D. P. Murrill**, District Sales Manager.

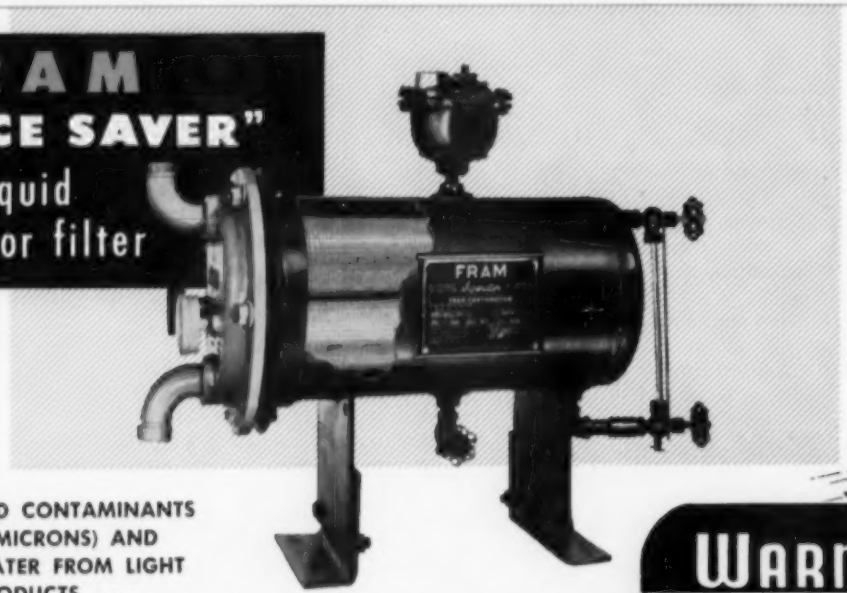
C & B—Fla.

The Cameron & Barkley Co., leading Southeastern distributor of industrial supplies and machine tools, has opened a new branch at **Cocoa Beach, Florida.** Industrial supplies and equipment most needed in the Cocoa Beach area will be stocked in their warehouse. Complete facilities of the Jacksonville and Orlando branches will continue their service through the Cocoa Beach outlet.

The new Cocoa Beach branch will be located in the Jaymas Building, at the intersection of Merritt Island Causeway and U. S. Highway AIA, situated between Patrick Air Force Base and Cape Canaveral. **William White** will be in charge of the office and Ben Ward will be local sales representative.

(Continued on Page 53)

FRAM
"SPACE SAVER"
liquid
separator filter



REMOVES SOLID CONTAMINANTS (DOWN TO 5 MICRONS) AND ENTRAINED WATER FROM LIGHT PETROLEUM PRODUCTS . . .

The scientific way to remove water and dirt from fuel at Truck, Bus, or Aircraft refueling stations. This Space-Saver unit will handle Kerosene, diesel fuel, gasoline and motor fuels at the rate of up to 60 GPM. Write for complete information.

WARNER LEWIS COMPANY
BOX 3096 • TULSA, OKLAHOMA
DIVISION OF FRAM CORPORATION

Teamed Engineering for EFFICIENT SEALDBULK HANDLING

U. S. Rubber Company and American MonoRail Engineers teamed up to develop this system.

The Sealdbin containers, a product of U. S. Rubber Co., each hold 11,000 pounds of costly carbon black. This American MonoRail System moves the Sealdbins from flat cars or trucks to special stations for discharge. Empty deflated containers are returned to the supplier for re-use.

Working together this expert team has minimized manual labor, time, and waste.

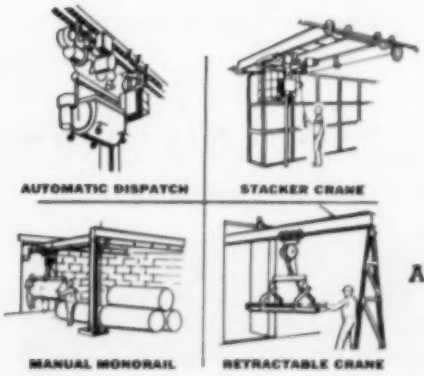
If you have a materials handling problem, call your nearby MonoRail Engineer or write us.

Send for Bulletin C-1.

US RUBBER

Member of Materials Handling Institute and MonoRail Mfrs. Assn.

For Power Driven Conveyors, Use Landahl Chainless Conveyors



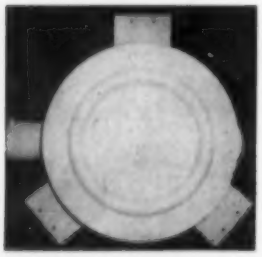
AMERICAN MONORAIL COMPANY

13105 ATHENS AVENUE • CLEVELAND 7, OHIO

(IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)

PROGRESS IN POWER through PROGRESS IN HEAT TRANSFER EQUIPMENT

Workman welding copper-nickel tubes to foot-thick steel tube sheet with 140-monel electrodes. Under destructive testing, rolled joints and tubes welded with cupro nickel rods leaked at elevated pressures, but tubes welded with 140-monel electrodes were leak-proof at 9600 psi.



End view showing torus ring welded to channel and channel cover. Access to head is obtained by cutting ring with special tool; torus ring can be re-used. Conventional split key ring assembly taking the load on the cover is retained.

FIRST ALL-WELDED FEEDWATER HEATERS

▶ A few years ago, an all-welded feedwater heater for 3600 psi and 790F would have been called a fantastic dream.

Yet six all-welded feedwater heaters in this pressure-temperature range are now proving their worth in the Linden, N. J., Generating Station of the Public Service Electric and Gas Company. Designed and manufactured by the Yuba Heat Transfer Division, formerly the Heat Exchanger Division of The Lummus Co., these heaters represent one of the many "firsts" contributed by this organization to the progress of the power industry.

In the heater shown above, two 50-inch-diameter cylinder sections of 1⅛-inch carbon steel were welded together. The open ends of the U-bends are welded, not roller-expanded, into the tube sheet (see upper small photo). Heads are sealed by a steel torus ring welded to channel cover and channel (see lower small photo).

The all-welded design minimizes the leakage which occurs in the conventional bolted and gasketed construction under high temperatures and pressures. Results are reduced maintenance and downtime.

This all-welded construction has been so successful it is certain to be specified for practically all future installations. Yuba engineers would be pleased to work with you. Call on them.

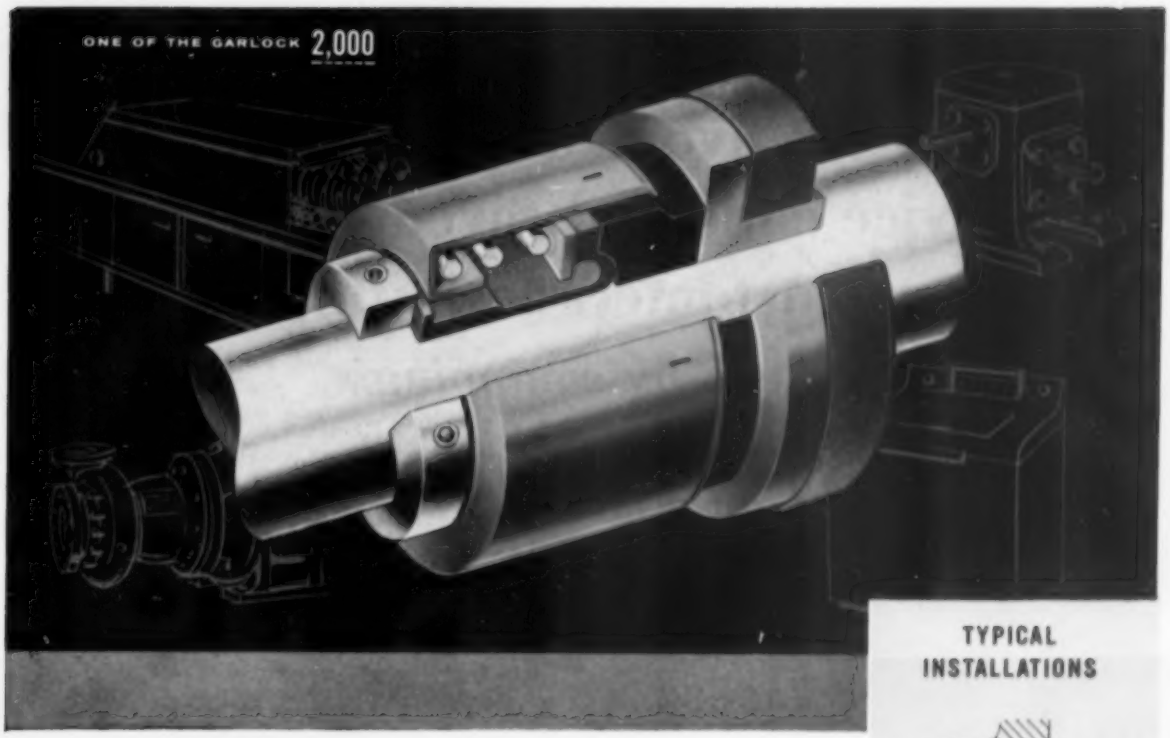
YUBA

CONSOLIDATED INDUSTRIES, INC.

Other Divisions Manufacturing Heat Transfer Equipment
California Steel Products Division, Richmond, Cal.
Adsco Division, Buffalo, N. Y.

YUBA HEAT TRANSFER DIVISION
HONESDALE, PENNSYLVANIA
NEW YORK SALES OFFICE: 530 FIFTH AVENUE
REPRESENTATIVES IN PRINCIPAL CITIES

STEAM SURFACE CONDENSERS • EVAPORATORS
STEAM JET REFRIGERATION • STEAM JET AIR EJECTORS
FEEDWATER HEATERS • BAROMETRIC CONDENSERS



THE PACKAGE SEAL
of a hundred uses

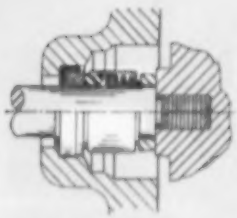
This Garlock MECHANIPAK* Seal BB-21A has proved itself on hundreds of jobs, sealing against water, oils, alcohol, mild acids, and solvents. It's ideal for shafts on centrifugal pumps, automatic washers, speed reducers, commercial dishwashers . . . wherever pressures do not exceed 150 psi.

Withstands temperatures to 212° F. with standard bellows . . . shaft speeds to 2000 fpm and higher depending on operating conditions. Sizes for ⅜" to 3" dia. shafts. Mechanical drive arrangement is engineered to eliminate slippage and simplify installation.

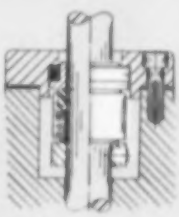
The BB-21A is another important part of "the Garlock 2,000"... two thousand different styles of packings, gaskets, and seals to meet all your needs. The only complete line. That's why you get unbiased recommendations from your Garlock representative. Call him today or write for Catalog AD-150.

*Registered Trademark

TYPICAL INSTALLATIONS



Centrifugal pump installation where stationary seat fits in housing and impeller provides stop for seal. A cup type vibration ring holds stationary seat. (Vibration ring design optional.)



Vertical shaft installation where lock-nut positions seal on shaft and stationary seat is in gland. A square vibration ring is used to hold stationary seat. (Vibration ring design optional.)

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

For prompt service, *contact one of our 30 sales offices and warehouses throughout the U. S. and Canada.*

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Rubber Expansion Joints, Fluorocarbon Products

"We avoided costly service calls and saved our customers irritating shutdowns .. *by equipping welders we sold with Fusetron Fuses*" . . . .

Frank Korinek, OWNER
SUN RAY ELECTRIC COMPANY
CHICAGO, ILL.

Mr. Korinek continues . . .

"About a year ago my motor rewind shop bought 62 welders for resale from a surplus dealer.

"They were 300 ampere arc welders, with the A.C. motor directly connected to a 300 ampere D.C. generator. The motor has a speed of 3500 R.P.M. and a nameplate rating of 56 amperes at 220 volts.

"The welders were equipped with 60 amp., 250 volt fuse clips. However, when we ran the welders in the shop, we found that ordinary 60 amp. fuses would blow on the starting current of the motor.

"We then tried 60 ampere Fusetron dual-element fuses. They proved to hold the starting current and to give the needed protection to the motor and generator.

"We are glad we had this experience in our own shop and installed Fusetron fuses before selling the welders. Otherwise, we would have had a flock of costly unnecessary service calls and run the risk of losing customers.

"As it happens, our customers are satisfied with the performance of the welders and we haven't had a service call or complaint about needless fuse blows."

FUSETRON dual-element FUSES do more than eliminate needless blows. They give 10 point protection not available with any other type of protective device.

AND FUSETRON FUSES REMAIN SAFE THRU THE YEARS . . .

. . . without maintenance and recalibration costs.

Once properly installed, Fusetron fuses require no costly inspection time or maintenance necessary on mechanically operated devices.

Dust, fumes, corrosion or age cannot prevent a Fusetron fuse from opening safely. There are no hinges, pivots or contacts to stick or slow down the operation of the fuse on short-circuits.

When a Fusetron fuse does open to protect, and after the fault has been corrected—the new Fusetron fuse you install has been calibrated at the factory by engineers—it is a fuse as safe and dependable as the one that blew.

DON'T RISK LOSSES! *One needless shutdown . . . one lost motor . . . one destroyed switch or panel . . . one burned out solenoid . . . may cost you far more than replacing every ordinary fuse with Fusetron dual-element fuses. Write for bulletin FIS.*

For loads above 600 amps.—Use BUSS Hi-Cap Fuses to coordinate your electrical circuits.

On 600 volts or less, BUSS Hi-Cap fuses have an interrupting capacity sufficient to handle any fault current regardless of system growth.

They can be coordinated with Fusetron fuses on feeder and branch circuits to limit fault outages to circuits of origin. Write for bulletin HCS.

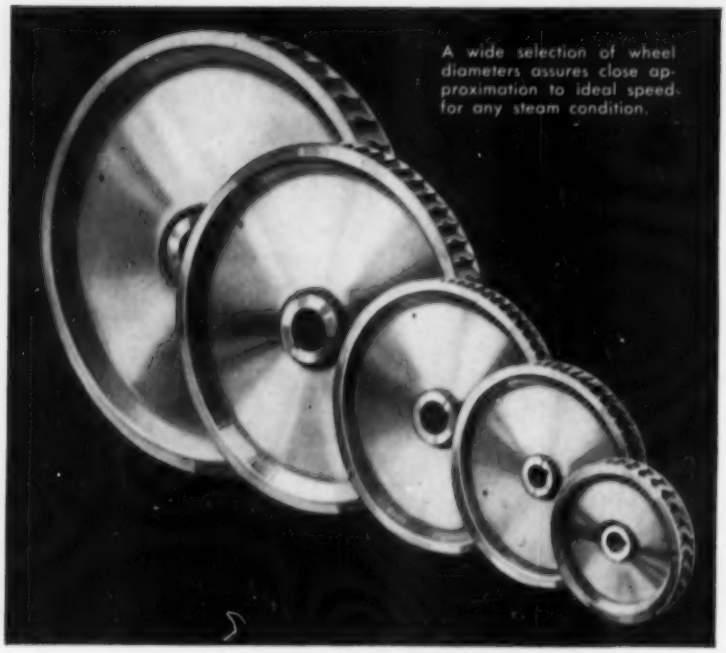
FUSETRON
TRUSTWORTHY NAMES IN ELECTRICAL PROTECTION
BUSS

Bussmann Mfg. Division
McGraw-Edison Co.
University at Jefferson, St. Louis 7, Mo.

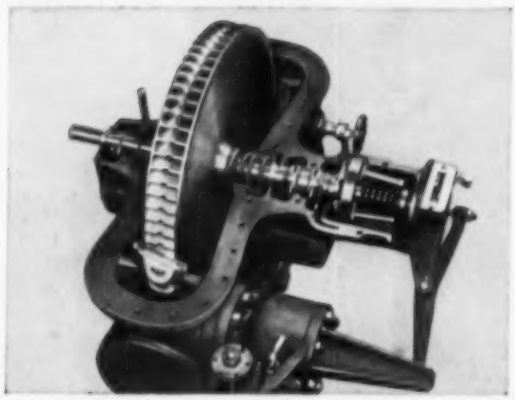
Play Safe! Install Fusetron dual-element fuses and BUSS Hi-Cap Fuses throughout entire Electrical System!

There's a TERRY wheel turbine to meet your specific needs!

SOLID-WHEEL DURABILITY COMES IN ALL SIZES...



A wide selection of wheel diameters assures close approximation to ideal speed for any steam condition.



Terry wheel turbine with cover removed to show the solid wheel. There are no separate parts to loosen or work out. Blade clearances are generous.

up to 2000 HP

Wherever you need dependable turbine drive up to 2000 HP—and strength and durability are major factors—Terry solid-wheel turbines are specifically equipped for the job. For, within their simple, sturdy casing is a rugged one-piece wheel.

You choose from a broad selection of sizes for all mechanical drive applications—with each Terry wheel turbine accurately proportioned to fit the operating conditions. From the smallest to the largest, these rugged turbines have:

- Solid one-piece wheel.
- Large radial and axial clearances.
- Double rim protected blading.
- Individual nozzle control.
- Dependable and durable governor.
- Heavy dust-proof bearing and governor housing.
- Independent overspeed trip with separate valve.
- Sturdy casing design.
- Strong and easily inspected steam strainer.
- Truly accessible construction, which makes inspection of the interior parts a simple matter.

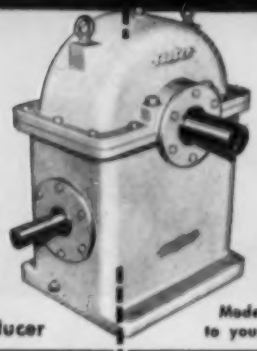
For full details, send for a copy of bulletin S-116.

THE TERRY STEAM TURBINE CO.
TERRY SQUARE, HARTFORD 1, CONN.

TERRY

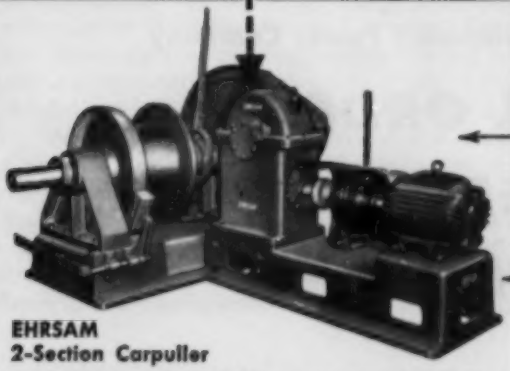
TT-1208

for every Class of Service... EHRSAM



Style W Speed Reducer

9 Standard Models—Also built to your specification



EHRSAM 2-Section Carpuller

Handles, spots all types freight cars on spurs, sidings. In two sections, easily assembled. Manual or remote control. Full power, torque range. Get detailed specifications!

SPEED REDUCERS TIE POWER to LOAD with GREATER EFFICIENCY

EHRSAM'S new Style W Speed Reducers deliver highest possible work efficiency to the job. You can use these tough, compact units in a complete range of service: *normal, intermittent and heaviest shock-load.* (We use this new Speed Reducer in special-application units, such as the EHRSAM 2-Section Carpuller.) New design features include alloy steel shafts, precision-ground steel worm and alloyed bronze gear; and all castings of extra-tough EHRSAM Micrometal. The new EHRSAM Style W Speed Reducers give you increased operating efficiency, reliable protection to expensive equipment throughout your plant.

The new Style W Speed Reducer is the rugged, efficient heart of the EHRSAM Carpuller

Write for Complete Catalogs, full specifications

EHRSAM

Over 80 Years of Dependable Service

THE J. B. EHRSAM & SONS MFG. CO.

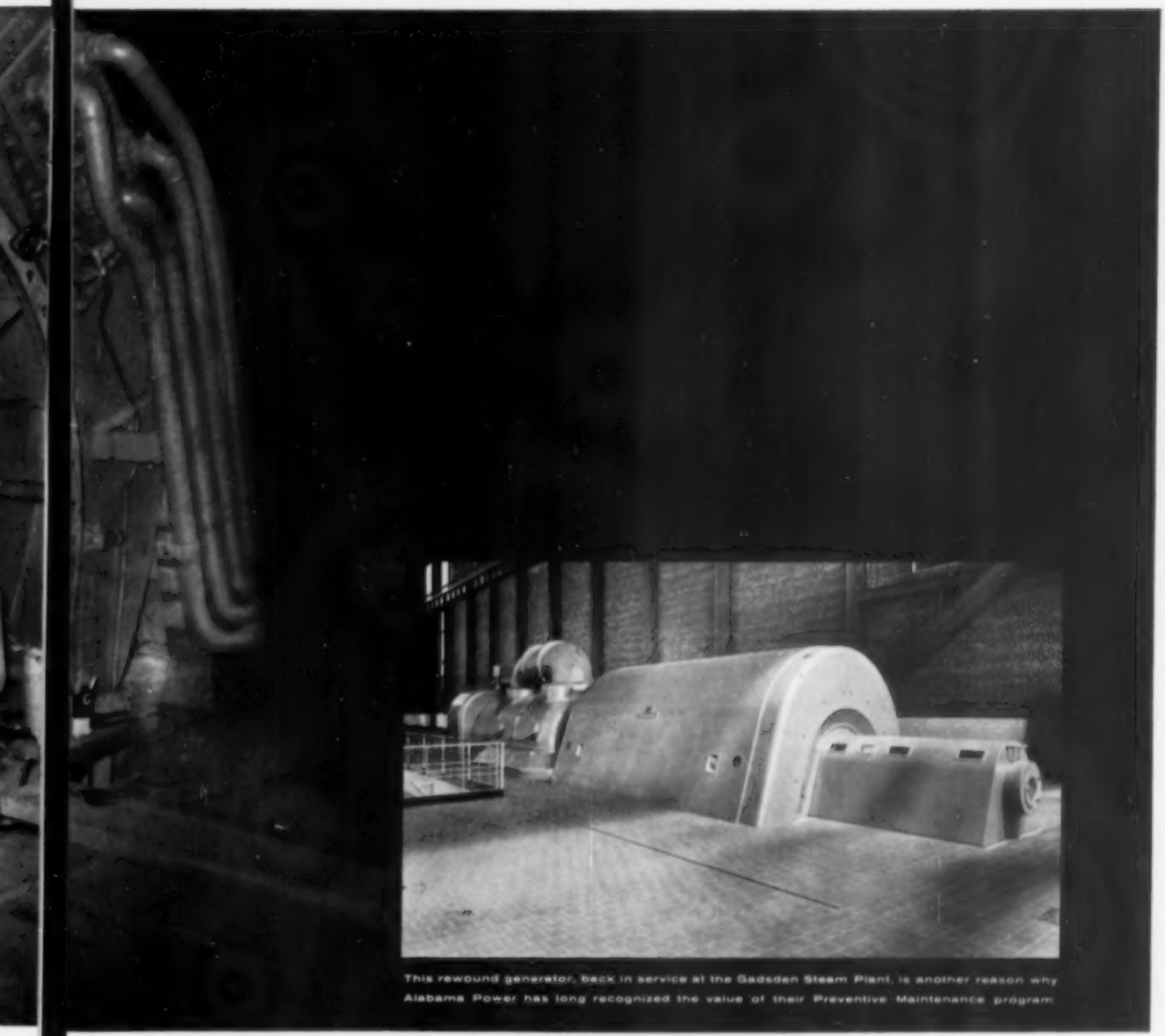
Dept. SP — Enterprise, Kansas

SALES OFFICES: Atlanta, Georgia; Denver, Colorado; Kansas City, Kansas
WEST COAST: Ehrsam Pacific, Inc., Riverside, California

For more information, use Reply Card—Page 119

Westinghouse Preventive Maintenance at Alabama Power Company

FROM COIL ORDER TO COMPLETED REWIND IN 4 WEEKS



This rewound generator, back in service at the Gadsden Steam Plant, is another reason why Alabama Power has long recognized the value of their Preventive Maintenance program

Westinghouse Preventive Maintenance Inspection Service serves Alabama Power Company, again. When Westinghouse field engineers inspected this 60,000-kw generator in February, 1957, during scheduled overhaul of the generating unit, they found conditions which led to a decision to rewind it during the outage then in progress. Westinghouse was ready with men and materials to do the job.

Alabama Power stated the unit couldn't be out of service for more than 5 weeks, or they would suffer additional loss. Westinghouse alerted its personnel, ordered the coils and started working 20 hours a day, 6 days a week, to strip and rewind. The job was completed March 14th, 28 days after the customer order was given.

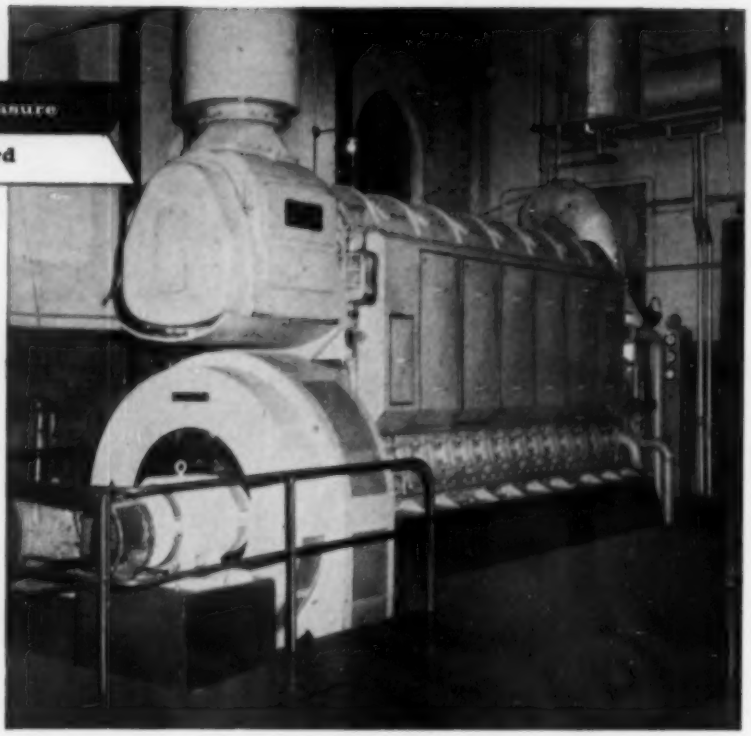
Skilled, highly trained Westinghouse field personnel will perform preventive maintenance inspection, on-the-spot repairs and modernization to keep your electric apparatus operating at peak efficiency. Nationwide, they are on call 24 hours a day with fast, reliable service.

Contact your Westinghouse salesman, or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-95183

YOU CAN BE SURE... IF IT'S Westinghouse

Where performance is the measure

F-M Power is the standard



Generating power for the city of Thief River Falls, Minn., is one of the most recent installations of the modern Opposed-Piston Diesel... continuing the F-M tradition of reliability.

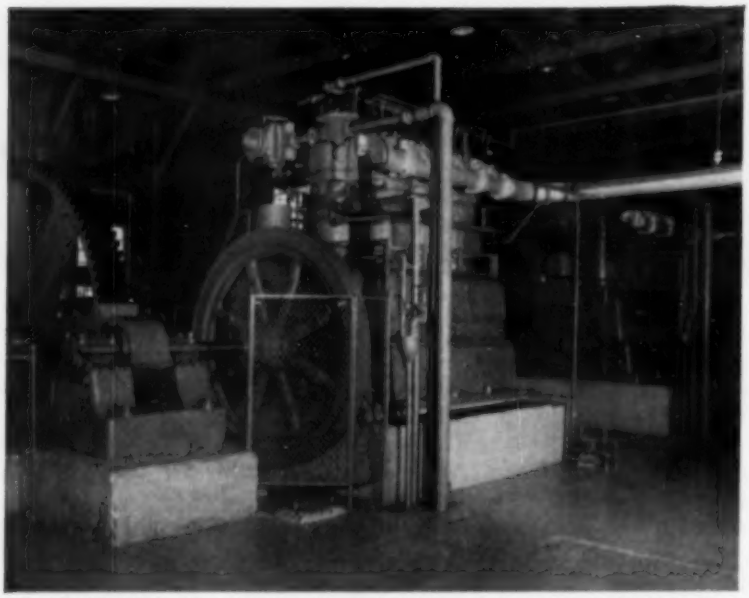
Throughout this country and in every corner of the world, you'll find Fairbanks-Morse diesel engines adding daily to an outstanding record of reliability . . . a record that goes back more than half a century.

Many of those "old" engines with "young" heavy-duty performance, stand side by side with the newest in modern diesel power—the F-M Opposed-Piston Diesel engine.

Reliability. . . is a long time

The O-P design of engine today offers unequaled features for heavy-duty power service: 40% fewer moving, *wearing* parts; more power in less space; less weight per horsepower, lower operating and maintenance costs.

6,000,000 installed horsepower of Opposed-Piston Diesels is now continuing the Fairbanks-Morse tradition of dependable, economical power generation. Time spent now in investigating the advantages offered you by the O-P will pay important dividends in the future, so write today for details to: Fairbanks, Morse & Co., Dept. SPI-10, Chicago 5, Illinois.



Typical of Fairbanks-Morse engines with nearly half a century of service is this F-M Type RE gas engine driving an F-M pump in water service for the city of Taft, California.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

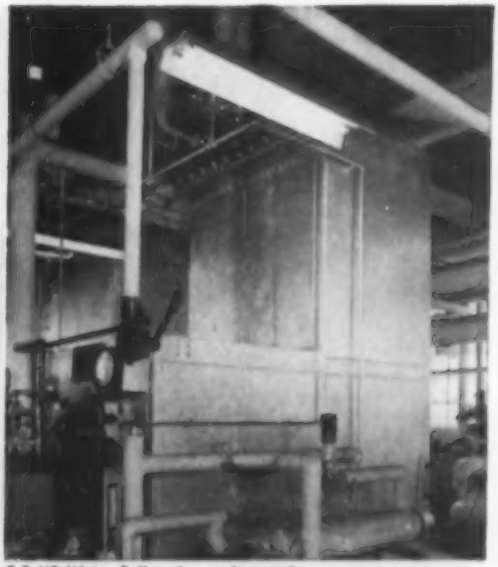
DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • RAIL CARS • ELECTRICAL MACHINERY • PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • MAGNETOS

The Cross Company specifies . . .

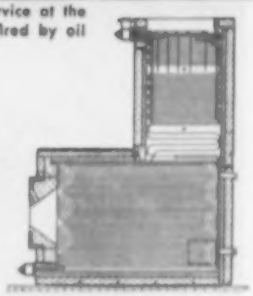
High temperature water by C-E for heating economy ...low maintenance

The Cross Company, pioneer producer of automation machinery, has recently completed an ultra-modern plant in Fraser, Michigan — practically doubling its former production capacity. After a thorough study of heating requirements . . . and with a view toward further expansion . . . two C-E LaMont Controlled Circulation Hot Water Boilers were specified for the new plant. According to Mr. W. P. Reece, Plant Engineer, "the study indicated that this system would provide the lowest fuel and maintenance costs . . . Experience during this winter confirms the soundness of our decision."

If you are in the market for a heating or process system, it will pay you, too, to investigate high temperature water. Individual needs vary, of course, and both hot water and steam boilers have their place. Our engineers will be pleased to discuss the subject with you or your consultants. Write for our catalog HCC-2.



C E HT Water Boilers in service at the Cross Company. They are fired by oil or natural gas.



Right — One of the 12 million Btu/hr Cross Company boilers. C-E HT Water Boilers are available in sizes from 10- to 300 million Btu per hour; pressures to 500 psi and temperatures to 470F.

Architect's drawing of the new Cross Company plant, Giffels and Vallet, Detroit, Consulting Engineers; Owen S. Lieberg, Associated Consultant.

THESE ARE THE GENERAL ADVANTAGES OF HIGH TEMPERATURE WATER:

1. Higher available heat — many times that of steam at the same pressure.
2. Closer control of temperature.
3. Lower heat loss . . . unused heat returns to the boiler . . . no condensate return lines.
4. No elaborate feedwater treatment . . . make-up requirements are exceptionally low.
5. Steam traps not required . . . trap problems and expense are eliminated.
6. No blowdown losses . . . no safety valve vent losses . . . no condensate losses.

THESE ARE THE SPECIFIC ADVANTAGES OF THE C-E "HT" WATER BOILER:

1. Complete control over circulation in both system and boiler.
2. No separate boiler pump is required, since low pressure loss is inherent.
3. Pressurized operation with oil or gas means no induced draft fan.
4. Single-pass design — no baffles — means cleaner boiler and lower draft loss.
5. Controlled, positive circulation permits more efficient arrangement of heating surfaces.
6. Any fuel — oil, gas, coal, or any combination of fuels.
7. Gastight, welded, steel casing.
8. Fewer headers, all of which are easily accessible.

COMBUSTION ENGINEERING

Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y.

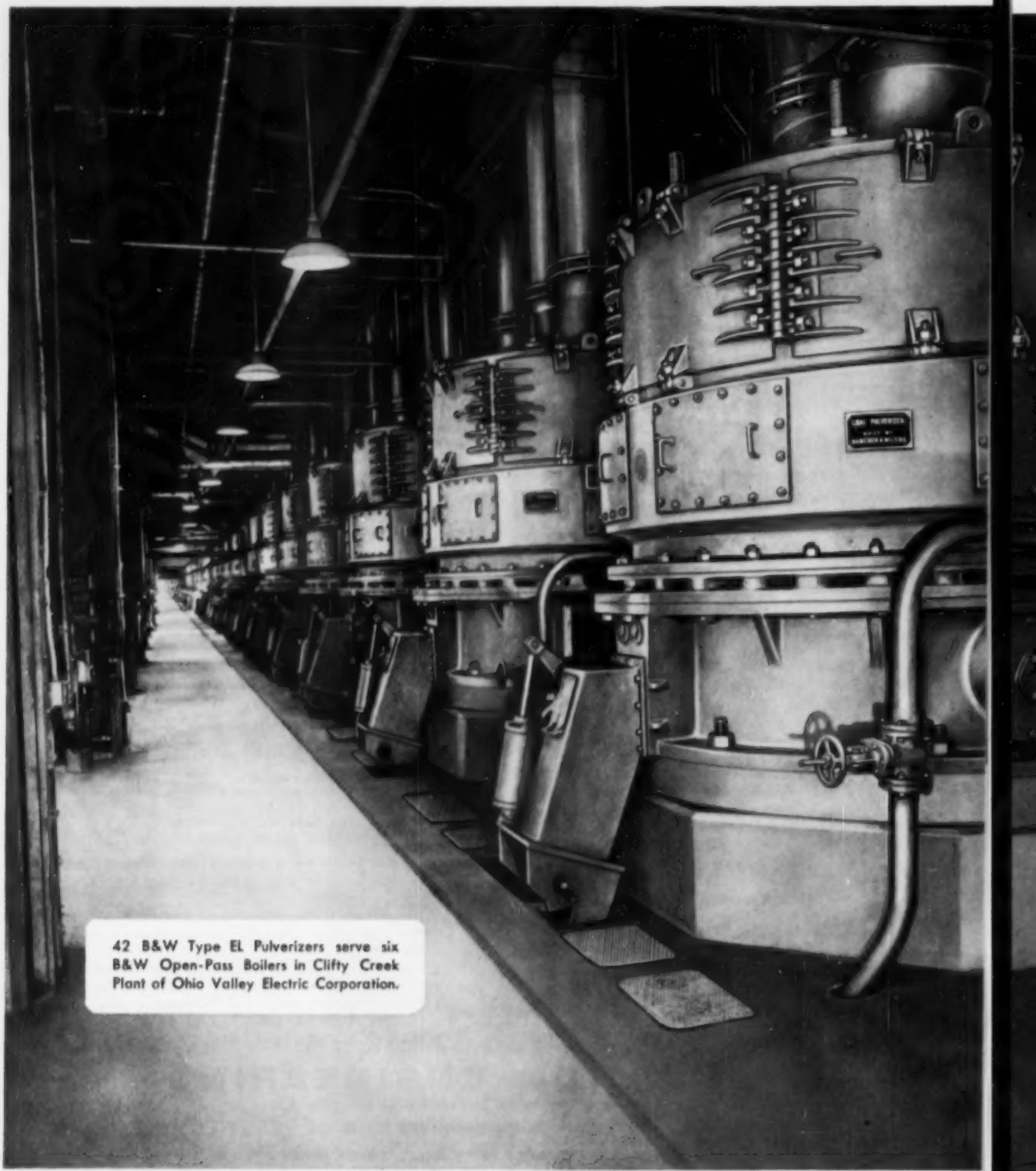
CANADA: COMBUSTION ENGINEERING-SUPERHEATER LTD.

B-990A

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

Have You Investigated

THE MODERN B&W



42 B&W Type EL Pulverizers serve six B&W Open-Pass Boilers in Clifty Creek Plant of Ohio Valley Electric Corporation.

DIRECT-FIRING SYSTEM?

A Compact, Space-Saving Package of Efficient Grinding Power

More power and capacity in a compact arrangement . . . long-range dependability . . . reduced operating cost — these are the measurable results of continuous, intensive development of the modern B&W Pulverizer. It has established an outstanding production and efficiency record in thousands of commercial installations. Here are some reasons why:

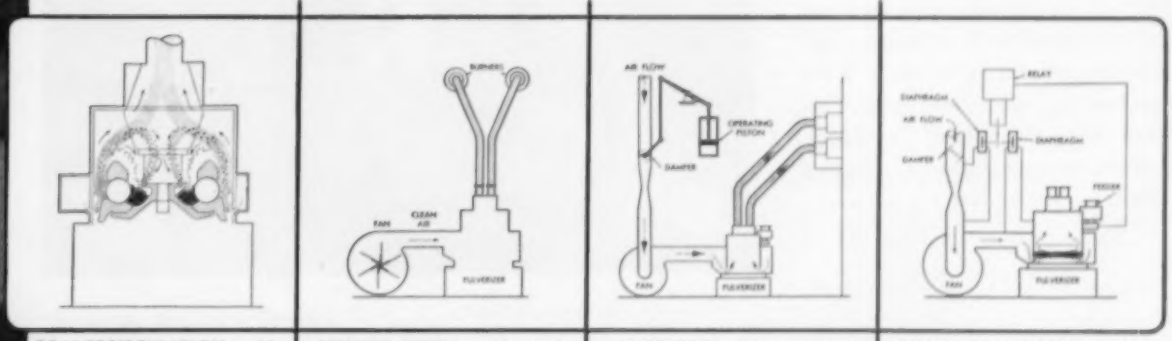
Continuous High Fineness Over Entire Service Life: Efficient combustion requires high fineness at all times. The high circulating load of the B&W Pulverizer permits efficient and dependable classification of product, so that only material of proper fineness leaves the unit. In addition, its slow-speed, spring-loaded ball bearing grinding elements maintain proper grinding contact throughout their service life.

Handles Wide Variety of Low Grade and Wet Coal: Regardless of the coal's grade or whether it's dry or soaking wet, the B&W Pulverizer's unique and exclusive recirculation of fuel through heated air assures efficient grinding . . . eliminates shutdown, capacity loss, or special attention from operators.

Simplicity of Arrangement and Reduced Maintenance: Accessibility for all normal maintenance makes it simple, quick, safe and low-cost. Adjustments are easily made while the unit is in operation. Using only clean primary air supplied under pressure, fan maintenance is substantially reduced and fuel piping is greatly simplified. Also, with the pulverizer acting as its own distributor, no special distributing devices are needed. Grinding elements are of special alloy material. They last two years or more on eastern coals and at least a year on midwestern coals.

Adaptable to All Types of Automatic Controls: Because it features "one point contact with the boiler," operation of the B&W Pulverizer is simple. The boiler's automatic combustion control is connected to the pulverizer at only one point—the damper in the primary-air duct. The pulverizer's own control system regulates all other functions, such as maintenance of proper fuel-air ratio and operating temperature.

SEND FOR DATA. For full information about the B&W Type EL Pulverizer and Pulverized-Fuel Firing Systems, write: The Babcock & Wilcox Company, 161 E. 42nd Street, New York 17, N. Y.



COAL RECIRCULATION — this means high fineness, aids drying.

PRESSURE SYSTEM — this eliminates fan wear, simplifies piping.

AIR CONTROL—this means one, simple control contact point.

MILL LEVEL CONTROL — this automatically adjusts fuel-feed.

BABCOCK & WILCOX BOILER DIVISION

G-766

Automation has raised productivity to new high levels

JEFFREY
Spiral Conveyors are important in moving materials

THE HIGH DEGREE of automation has raised productivity per man to new high levels in many plants throughout industry. Transfer of materials is largely under automatic control, for example, as evidenced by these Jeffrey spiral conveyor systems.

Jeffrey spiral conveyors offer an economical means of handling dry, loose bulk materials. Compact, they occupy a minimum of space. Convenient, they can be fed or discharged at any point along their length. Jeffrey makes them in open and dust-tight styles, of metals to suit particular requirements.

Jeffrey engineers will assist in selecting conveyors to meet your handling needs. Catalog 851 describes spiral conveyors. The Jeffrey Manufacturing Company, 898 North Fourth Street, Columbus 16, Ohio.

Paper stock in a paper mill is automatically moved from one operation to another by spiral conveyors.

CONVEYING • PROCESSING • MINING EQUIPMENT . . . TRANSMISSION MACHINERY . . . CONTRACT MANUFACTURING

JEFFREY

News (Continued)

DeVilbiss—Atlanta

The direct factory branch of **The DeVilbiss Company** in Atlanta has moved to new and larger quarters at 1100 Northside Drive, N.W. The new brick building has nearly 12,000 square feet of floor space, virtually double the room in the previous building at 1319 Spring Street, N.W. In addition it is close to arterial highways and has spacious off-street parking facilities.

The Atlanta branch will continue to be headed by **Roy Steele**, divisional sales manager.

Geo. L. Simonds Co. Now Leslie Florida Agent

The Geo. L. Simonds Company, with headquarters in Winter Haven, Fla., and branch offices in Jacksonville and Pensacola, is now Florida agent for **Leslie Co.** regulators and controllers.

Richard L. Simonds

Richard L. Simonds has been president of the company since 1947. **James Humphreys**, sales engineer of the company's Steam Division and **Robert Bruce**, district manager at the Jacksonville office, recently completed special training courses at the Lyndhurst plant of the Leslie Co.

Reynolds Metals—Texas

The alumina plant operated at Corpus Christi by Reynolds Metals Co. has been named the **Sherwin Plant**, in memory of the late R. S. Sherwin, Sr., a former Reynolds' vice president and one of the world's foremost authorities on production of the powdery substance from which aluminum is made.

NEW! COMPACT POWER SWEEPER Priced for Small Plant Budgets!

DESIGNED FOR CONGESTED AREAS, NARROW AISLES

Priced as low as $1475

GETS IN TIGHT SPOTS! Wayne "704" is designed for narrow aisles.

ADVANCED FEATURES OF WAYNE "704"

- More effective hopper capacity
- No dust bag to empty
- Longer brush life
- 3-speed transmission
- Vacuum attachments available for cleaning bins, equipment.

WAYNE '704'

Here's the answer for efficient power sweeping in plants of all types and sizes. The new WAYNE "704" power sweeper is smaller yet engineered to sweep faster, better... in and around tight spots, closer to machinery and equipment. What's more, the WAYNE is ruggedly constructed and offers big sweeper performance with many of Wayne's finer sweeper features at a budget price.

ASK FOR A DEMONSTRATION IN YOUR PLANT!

Let us show you how WAYNE sweeps cleaner, is more maneuverable and easier to operate. Fill out and mail coupon. No obligation.

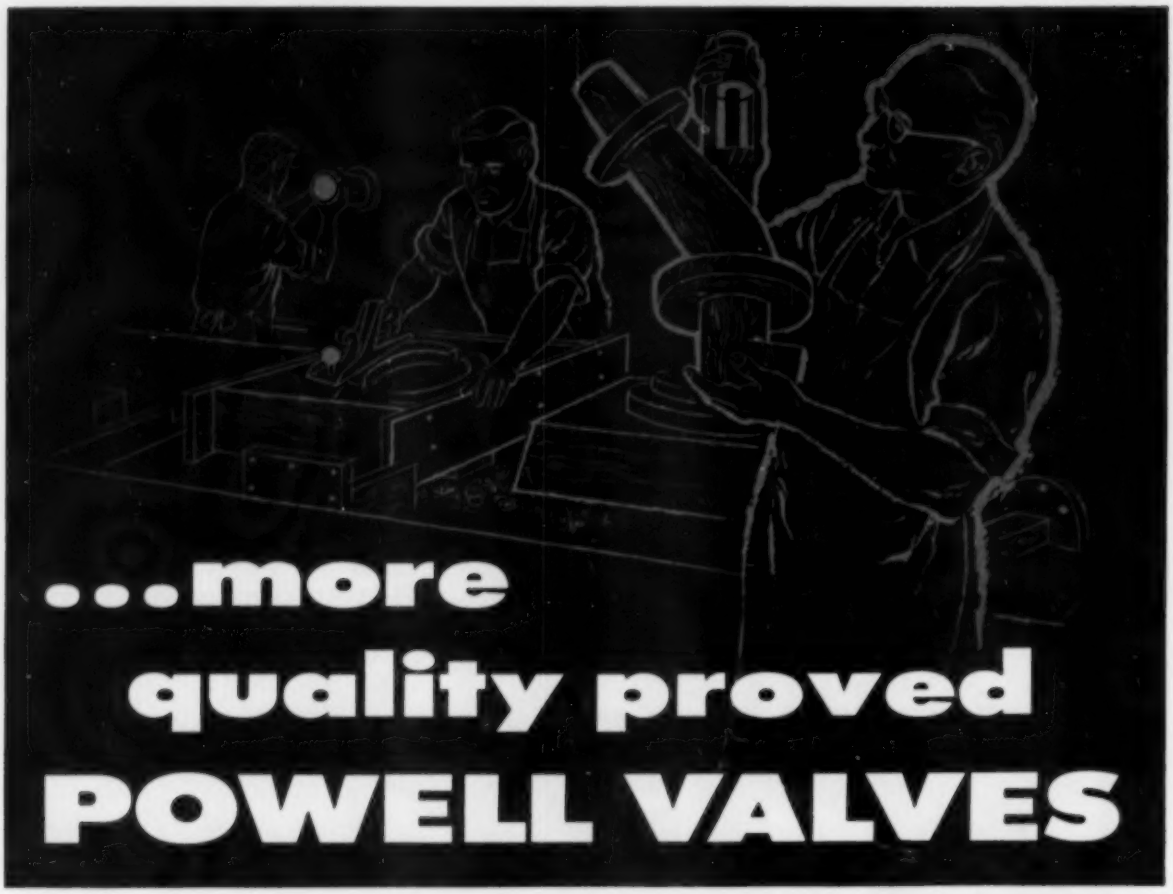
Four sizes for every need.
Gasoline, LP gas or battery powered.

WAYNE MANUFACTURING COMPANY
1476 E. Lexington Avenue, Pomona, California

☐ Demonstrate the new Wayne "704"
☐ Send folder and list of satisfied users.

Name _____
Title _____
Company _____
Address _____
City _____ State _____

World's Largest Producer of Power Sweepers for Cities and Industry



...more quality proved POWELL VALVES

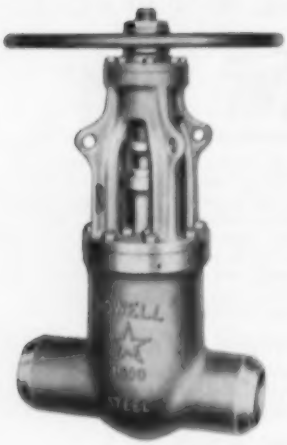
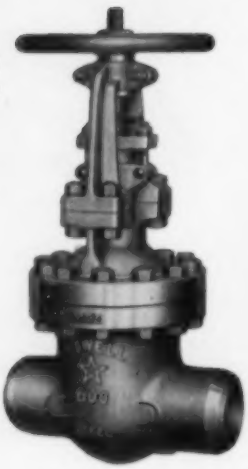


Fig. 11303—1500-Pound Cast Steel Pressure Seal Gate Valve.

Fig. 375—Bronze Gate Valve for 200 Pounds W.S.P. Union Bonnet. Inside Screw Rising Stem.

Fig. 11365—Steel Pressure Seal Horizontal Lift Check Valve for 1500 Pounds W.S.P.

Fig. 6003-WE—Steel Gate Valve for 600 Pounds. Welding Ends. Outside Screw Rising Stem and Yoke.



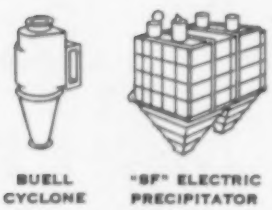
for quality-crafted flow control

Ask your Powell Valve Distributor for the facts about quality-proved bronze, iron, steel and corrosion-resistant valves. Whatever your flow control problem, there's a Powell Valve to solve it.

THE WM. POWELL COMPANY, CINCINNATI 22, OHIO . . . 111th YEAR

How to tame a dust collection problem

Look for the 'hidden' factors that deliver important *extra efficiency*, like the exclusive Shave-off in Buell Cyclones that harnesses the double-eddy currents to trap an extra percentage of dust. Side-entry of gases, Buell-designed manifolds, proper proportioning, extra-heavy-plate construction provide even more efficiency. Send for the ready reference booklet, "The Collection and Recovery of Industrial Dusts". Dept. 80-J, Buell Engineering Company, Inc., 70 Pine Street, New York 5, New York



BUELL CYCLONE

"SF" ELECTRIC PRECIPITATOR

PRECIPITATOR-CYCLONE COMBINATION

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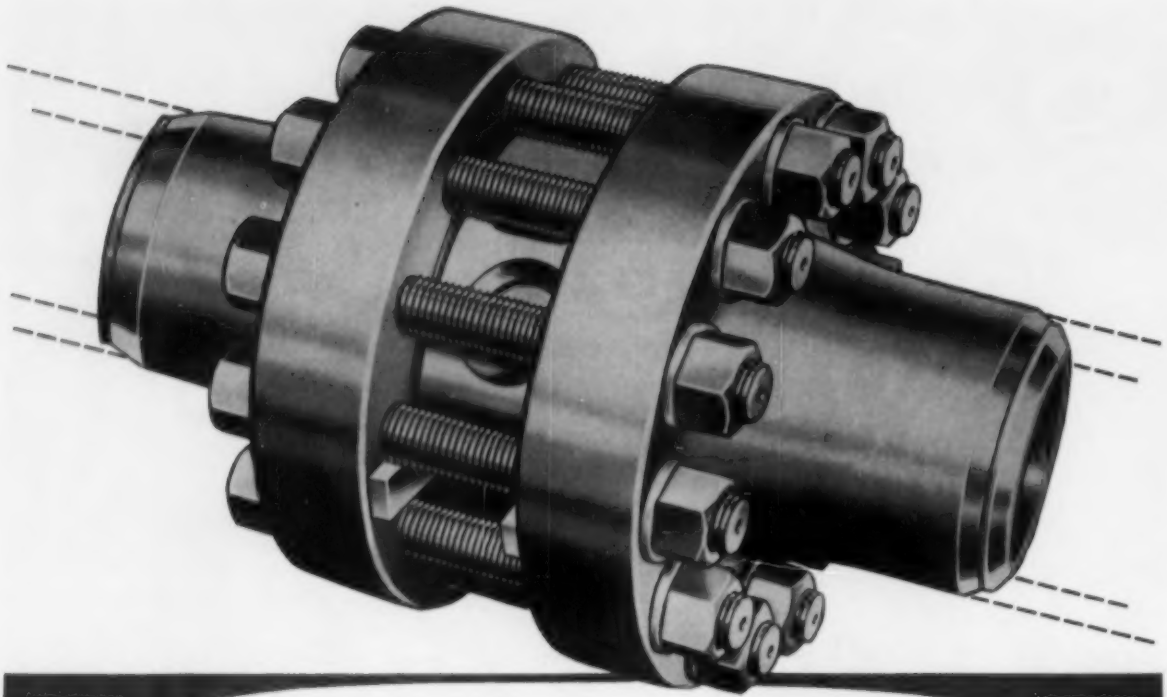
Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**



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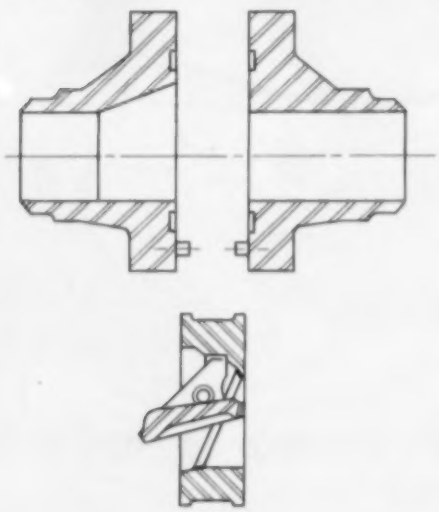

The Chapman Valve Manufacturing Co.

INDIAN ORCHARD, MASS.

INDUSTRY SPEAKS

Every New Plant Promotes Another

THE IMPACT of the South's new economic development has hardly been felt, said HOWARD B. JOHNSON, president of Atlantic Steel Company. In an address in Miami, before the Annual Credit Congress of the National Association of Credit Men. The following comments are abstracted from his speech.

EVERY NEW primary plant moving into the South opens up the possibility of a large number of secondary plants being developed in the region. It is just a matter of time before the secondary development takes place on a large scale and along with it, development of a skilled labor force, large pools of equity capital and large numbers of new business and service enterprises. It is a built-in expansion process.

In the eleven Southeastern states, a total of 4,105 new manufacturing plants with twenty-five or more employees were added in the ten years between 1946 and 1955, with over one billion dollars being spent last year on new or expanded facilities.

In the post-war period, the Southeast has added manufacturing employment at a rate one-third higher than that in the rest of the country. However, despite this impressive gain, the factory still plays a relatively small role in the South's economy, with manufacturing accounting for only 18% of the region's total income.

Statistical gains are relatively unimportant compared to the change in the basic nature of the South's economy. Almost completely bypassed by the first Industrial Revolution, and only twenty years ago still a colonial economy, the South today is fast maturing and the region is participating fully in the second Industrial Revolution which is sweeping the nation.

The opening up of the economic frontier of the South might well be the major factor in the continued expansion of the United States economy in the next thirty or forty years—opening up new areas for investment, production, consumption, and capitalistic enterprise.

Another major economic trend in recent years is income. The per capita income in the Southeast is more than four times as great today as it was in 1939. This gain compares with a threefold increase in the rest of the nation.

As a result of this gain, per capita income in the Southeast now is about two-thirds as great as that in the rest of the nation. In 1939, it was only one-half as great.

As you know, automation is becoming more of a necessity in all major industry. The watchwords now are mechanization and speed. Perhaps we are like that native of our own Okefenokee Swamp who was asked if it were true that an alligator would not attack a man who was carrying a flashlight. He replied, "It all depends on how fast he carries it."

The South is certainly contributing to, and sharing in the dynamic development of the nation. This area continues to attract new industry on the basis of abundant raw materials and natural resources, ample labor, favorable tax and labor laws, mild climate, pleasant living conditions and growing markets.

The South is changing fast. For the first time, there is the beginning of a balance between manufacturing and agriculture in the region's economy.

As for our national prosperity, perhaps no nation in the history of the world has ever increased its physical output in peace time as rapidly as our nation has since the end of World War II. Our gross national product in 1946 of 209 billion dollars was almost doubled in 1956 for a total of 412 billion dollars. Admittedly, higher prices have been an important factor in the rise, but after adjusting for price changes, the real gain in physical terms is still about 42% — quite an impressive showing for the ten year period.

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TIMELY COMMENTS

Don't Miss the Wagon

PLANNING is required in order to enjoy a good picnic.

Gains in the South are impressive. The direction is up, but we have a long way to go.

Operations that plan for this excursion and build in advance to meet the opportunity will be in better positions than those that try to hop on the wagon after it reaches full speed.

Southern industrial buyers are not very different from those in other parts of the country, but that little difference is important. They are a little more reluctant to make new contacts, and we think they are a lot more loyal to their friends.

Friendships and loyalties are built strongest in times of adversity. Many new Southern plants are experiencing normal adolescent pains at this time. They need help, advice, credit, information and friends. Suppliers that help them through this difficult period will be held in highest esteem when buying gets bigger.

This indeed is a time of cooperation in the South. Industrial people realize that success breeds success. And no one wants to see a failure — even of a competitor — because every failure hurts the area. And "what's good for the area is good for business."

THIS BETTER PRODUCTION issue is an excellent example of cooperation. Information to help the other fellow has been sent in from a great many sources. Very few engineers want to bottle-up information. Plant men have cooperated by writing about their best developments, and companies (big and little) have stamped their approval on dissimination of helpful material. It has not always been this way; we used to have more secrets in the South than anywhere. But that day is gone. Now, plant managers are glad to pass their know-how along to others. They even have public relations departments and publicity managers to help the cause. Therein lies the success of this special issue.

Readers will do well to examine every article. Not a single item was cooked-up for propaganda. Every one describes a specific solution that has been genuinely helpful. Perhaps few of the recommendations can be adopted exactly in other plants. But the brainstorming value is enormous. Ideas for today, tomorrow, and for long range planning are plentiful.

SO DON'T MISS THE WAGON — Use this issue. Discuss the improvements that are described. Write the editors, manufacturers and authors for more information if needed. Get plans underway for making improvements. And then, if you like what we have given you in this issue, you can reciprocate by reporting on your own best developments. The editors welcome correspondence with engineers in the field they serve.

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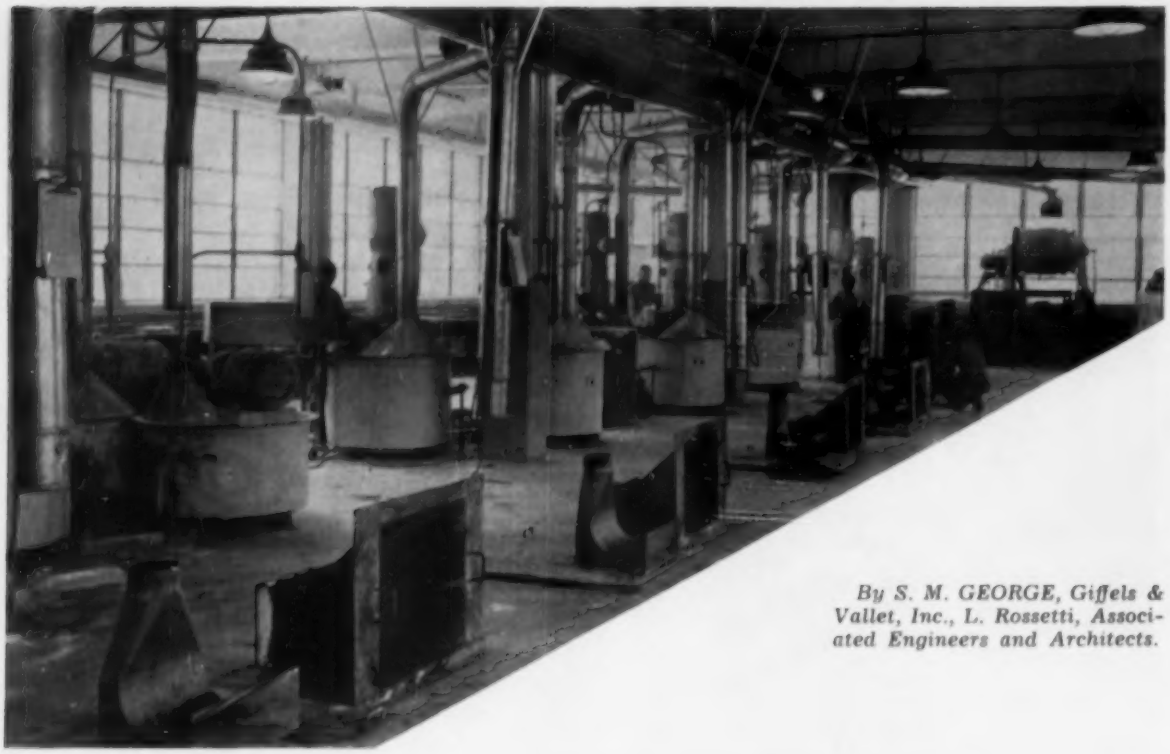


By S. M. GEORGE, Giffels & Vallet, Inc., L. Rossetti, Associated Engineers and Architects.

Case 1 — North Carolina Paint and Varnish Company

Expansion and Modernization Equipment Mounted Overhead Saves Space

TO KEEP PACE with the demands in the Southeast, The Carolina Paint and Varnish Company, Greensboro, North Carolina, embarked on an expansion program in late 1955.

Expanded facilities, now in operation, have increased the plant's capacity by about 50 per cent.

At the outset of the program, Carolina planned to construct a 30,000 sq ft addition to provide additional space for research, storage and administration, and had not contemplated that the resultant layout would also increase capacity to such a degree.

Operation Studied

But in planning the integration of the new facilities with the original plant, which began production in 1949, the entire plant operation was studied.

R. G. Brooks, plant manager, his staff, and their consultants, Giffels & Vallet, Inc., L. Rossetti, associated engineers and architects of Detroit, Michigan, evaluated many factors, including production methods, equipment locations and future expansion requirements.

This engineering planning revealed that congestion prevailed on the fourth floor of the original building, between raw material storage, mixing and charging facilities.

Further, the split thinning and tinting operations between the third and second floors were not effectively employed, and space for laboratory facilities directly concerned with these operations was inadequate.

It also was discovered that the flat slab construction of the original building made any relocation of tanks and equipment within this structure impractical. The floor spacing also discouraged the raising of the blending tanks to gain clearance for the dispensation of materials under them. It also was found that the offices on the first floor were inadequate, and that insufficient space was allotted in the basement for finished goods storage, maintenance and employee facilities.

From these findings, it became apparent that not only was additional area required but extensive improvement was needed in the overall plant arrangement.

Equipment Relocated

By relocating all productive equipment, a more efficient operation was attained requiring only three floors in the addition, leaving the remodeled original building for non-productive operations.

Mixing equipment and ball mill charging facilities, which were on the fourth floor in the original structure, were transferred to the third floor of the annex.

Speedline, roll mill and ball mill grinding equipment was moved from the third floor to the second

PHOTOGRAPHS

Opposite page:

New arrangement of paste mixers and batch charging facilities for ball mills suspended just below third floor. Note plate covered opening and fume control system used during charging ball mills.

Above:

View of second floor in the new annex showing the suspended ball mills over the thinning tanks which hang through the floor into the filling department below.

Right:

First floor showing the bottoms of the thinning tanks suspended over the filling lines that include automatic labelers and carton sealers. The conveyors in the foreground feed to a spiral chute and feed table in finished product storage in the basement.

---

level in the new building. This relocation permitted the ball mills to be hung near the ceiling on supporting frames, enabling them to be conveniently charged from

the floor above. To make maximum use of the additional clearance under the mills for liquid transfer, the thinning tanks were extended through the second floor into the filling area below. With the thinning tanks at floor level, the adjacent tinting operations were markedly improved.

The first floor of the annex is used for filling, labeling and packing. To the east at this level and adjacent to the filling area, a new roof was constructed. Now used for drum storage of raw materials, its design allows for the addition of future second and third floors. In the basement of the new building, finished goods are stored, which are serviced by an automatic pallet conveyor carton chutes and roller conveyors.

Tabulation of Areas — sq ft

	Original	Added	Total
Administrative	2,920	2,680	5,600
Laboratory	1,800	3,600	5,400
Mix & Grind	13,630	315	13,945
Fill & Pack	6,175	—175	6,000
Finished Goods	20,970	11,545	32,515
Raw Materials	12,715	9,040	21,755
Inside Tanks	3,440		3,440
Miscellaneous	7,290	2,995	10,285
Total Area	68,940	30,000	98,940

In the original structure, remodeled offices are now on the top floor; raw materials are stored on the third floor, adjacent to point of use; laboratory facilities are on the second floor, convenient to all thinning and tinting operations in the annex; and on the first floor are stored raw materials, special orders, and industrial finished goods.

Location of facilities for maintenance and employees is unchanged. Though expanded, they remain in the basement of the original structure.

In commenting on the completed program, R. G. Brooks said, "The new layout has eliminated production congestion, provided for expanded storage areas, eased future expansion, and has resulted in a reduction of handling cost."

Case 2 — Georgia Transformer Plant

Conveyors Aid Mass Production

EVEN HIGH quality precision equipment can be manufactured by mass production processes. This is demonstrated in the Central Georgia plant of a nationally known electrical manufacturer. Company officials attribute success of the continuous flow production of medium transformers to mechanized handling of materials.

Three types of conveyors are used in the operation —dragline, moving sidewalk and elevator slat conveyors. These extend a total of nearly a half mile. Completed transformers are even transported through 12 test berths on conveyors.

Conveyors designed and fabricated by the Logan Co. of Louisville, Ky., help to reduce the manufacturing cycle by one-third. Repetitive manufacturing has enabled the company to increase output by 59% without sacrificing quality.

Mass production is dependent upon adequate, well designed conveyors.

Case 3 — Alabama Docks

Ship and Barge Unloaders

THE BOAT unloader at left has a maximum capacity of 800 tons per hour and is used in unloading bauxite and various ores from ocean vessels and transferring them to a conveyor system for storage or loading into barges or railroad cars. A second duplicate unit is now being built at this same location to further increase the capacity of this modern ship-to-shore transfer station at Mobile.

The high capacity of this equipment is largely responsible for reducing the unloading cost per ton of material, and also for reducing the turn-around time of vessels at this port.

The Alabama Power Company, Barry Steam Plant unit is used for unloading coal from barges. Coal is unloaded with a 10 ton capacity bucket at a maximum rate of 1200 tons per hour. This unit, in contrast to the Alabama State Docks job, is stationary and the barges are moved back and forth under the unloader by means of winches; whereas, the Alabama State Docks unloader which is serving ships, is mounted on wheels and travels from hatch to hatch. Both units were built by Heyl & Patterson, Inc., Consulting Engineers, of Pittsburgh.

Case 4 — Delaware Factory

Longer Life for Hot Rolls

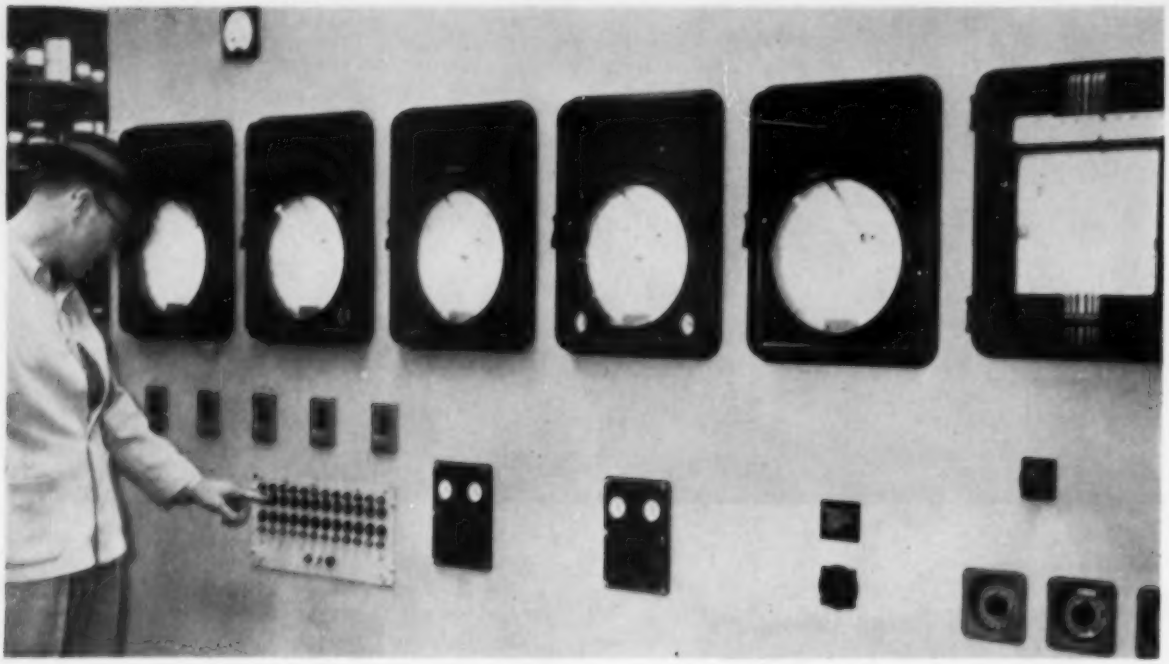
IT ISN'T often that equipment life can be prolonged ten-fold by the adoption of a new material. But that's what happened when Hypalon was tried as the covering on a planishing roll at Delaware Floor Products Division of Congoleum-Nairn, Inc., Wilmington, Delaware.

A planishing roll is one of the many rolls on the calendering machine used in the manufacture of plastic floor covering. Its function is to give a high polish to the surface of the flooring material.

Unusually good abrasion and heat resistance is required of a rubber compound in this application. Hot plastic sheeting, directly from the steam heated calender rolls, is run at 30-100 ft per min. between the rubber and chrome plated rolls. Although the rubber roll is water cooled internally, its surface temperature normally reaches 250-260 F.

Previous rubber compounds used by Congoleum-Nairn lasted two weeks or less in this service before regrinding of the surface was necessary. The roll covered with Hypalon has been in constant service polishing plastic flooring 24 hours a day, five days a week, since November, 1956. No repairs or resurfacing whatever have been done to the roll since that time.

Surface temperature of the Hypalon being checked. This polishing roll normally runs as hot as 260 F.



Instrument and control panel of automatic system at Plant X, Earth, Texas.

Case 5 — Texas Public Utility Company

Cooling Towers — How an Automatic Control System Paid Off at Plant X

WATER conservation is the accepted practice in the region near Earth, Texas, where Southwestern Public Service Company's Plant X is located, not only to reduce operating cost but more importantly to prolong the life of existing ground water supplies.

Plant X is equipped with a closed circuit condenser cooling water system. It has three units with a total of six cooling towers. Total capability of the plant is 277,500 kw.

When the concentration of dissolved solids in cooling water is controlled by manual blowdown, the results are usually very poor. Since perfect control is virtually impossible, a cautious operator usually bleeds more water from the system than necessary. As a result, both water and treating chemicals may be wasted.

Manual control of chemical treating presents even greater problems. If not enough acid is added, scale is deposited, fouling the condenser tubes and lowering the vacuum. Acidizing and other methods of scale removal are quite costly. If too much acid were to be added, the resulting corrosion would also cause high maintenance cost. In addition, if manual control of chemical treating basin water level and blowdown is to be attempted, considerable operating time must be expended. Necessary frequent chemical checks as a guide to treatment or blowdown operations result in inefficient use of supervisory personnel.

The Design Engineers of Southwestern Public Service Company determined that if an automatic control system for cooling towers were to solve these problems, it must perform the following functions:

1. Maintain the correct basin water level under all load conditions.

2. Hold concentration of dissolved solids within very narrow limits to prevent over-treating or under-treating the make-up water.

3. Govern the treatment of raw water make-up to prevent wasting water and chemicals by excessive blowdown.

These specifications were met with the Bailey Meter Company Control System. Although numerous schemes have been devised previously, Southwestern believes the principle of this control system to be the first truly automatic one.

Controlling Basin Level — A signal from a Bailey Condensate Flow Transmitter is used to position a control valve in the cooling tower make-up water line. The feed-back signal from the Bailey Basin Level Recorder-Controller modifies make-up water flow if necessary.

As an example, assume that the permissible concentration of suspended solids in the circulating water is four times that of the make-up water. This means that the blowdown rate will be approximately ¼ the make-up rate. Thus, for each pound of conden-

sate, 1¼ lb of make-up water must be added — to replace 1 lb lost by evaporation and ¼ lb lost by blowdown. These values are approximate, the basin level control feed-back signal is used to maintain desired water storage volume.

Controlling Blowdown Rate — Since the blowdown rate has a fixed relation to evaporation loss (the exact ratio can be predetermined from an analysis of the raw water), and since condensate flow is approximately equal to evaporation loss, the signal from the Bailey Condensate Flow Meter is used to position a valve in the blowdown line. A feed-back signal from a Bailey Waste Flow Transmitter modifies blowdown rate.

Controlling Chemical Feed — After the proper quantities of chemicals have been determined from tests, they can be controlled on the basis of make-up water flow. A signal from a Bailey Make-up Water Flow Transmitter positions a control valve in the chemical feed line. A feed-back signal from a pH or a conductivity meter may be used to modify chemical feed, if desired.

Pneumatic control of cooling tower operation by a Bailey Meter Company Control system has been responsible for reducing scale and/or reducing corrosion in steam condensers, eliminating excessive water consumption, conserving water-treating chemicals, and providing for more efficient use of supervisory personnel.

Case 6 — Tennessee Woodworking Plant

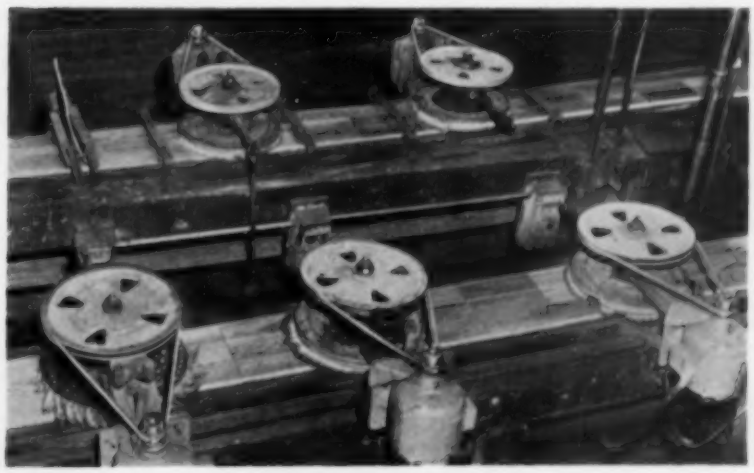
Drive Costs Reduced $600

SECTIONS of two of the E. L. Bruce Company's six conveyor lines on which tongue-and-groove hardwood flooring is sanded, waxed, polished and baked are illustrated. The Memphis, Tennessee company had been using standard "A" section V-Belts to drive 24 polishers on each of six continuous operation conveyor lines — 144 drives in all.

Due to the necessity for extremely small motor sheaves to reduce motor speed to slow polishing speed, standard V-Belts wore out within 2 weeks to 2 months. Infra-red lamps (not shown) multiplied heat build-up in the standard V-Belts.

Dayton Rubber Company's Cog-Belts, featuring extra-flexible heat-dissipating design, were recommended by Felix Tanner, Power Transmission Dept., Memphis Bearing and Supply Co. The Cog-Belts were test run on two lines (48 drives) operating continuously 8 hours a day, 5 days a week for one year.

Plant engineering personnel report that the new belts consistently lasted longer. A great majority lasted the full year. Savings during the test period ran $200 in V-Belts alone. Since incorporation on all conveyor line drives, annual savings of more than $600 have been obtained.

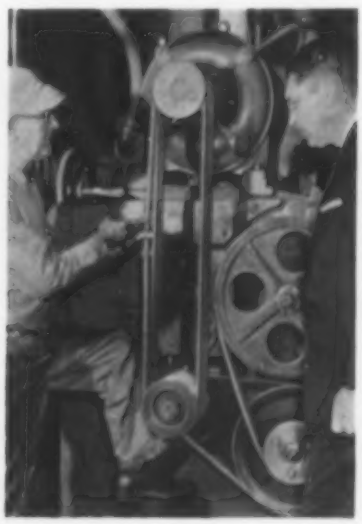


More Information Available

MANY of these plant-tested techniques can be put to work towards increasing production in your own plant. Case studies in this 10th Annual BETTER PRODUCTION Issue are necessarily brief. Emphasis is concentrated on direct information — need and objectives, description of improvements, and results.

TO HELP you put these ideas and methods to work, equipment manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply house, manufacturers representative, the equipment manufacturer, or drop a note to SPI, 806 Peachtree St., N.E., Atlanta 8, Georgia. There is no obligation.

Dayton Cog-Belts are also used on tough drives like this rip saw. Hess Jones, E. L. Bruce Company's maintenance engineer, discusses the drives with Felix Tanner of the Memphis Bearing and Supply Co.



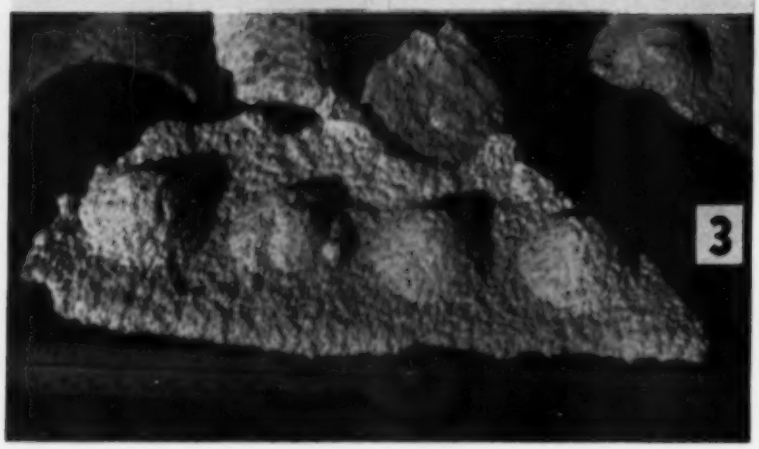


Fig. 1. Shows scale thru top manhole. At bottom of manhole are large slabs of half inch scale which were taken from outer shell.

Fig. 2. Shows ¼" scale found on other tubes. Water leg around fire doors was virtually solid with scale and it was here that the estimated 10% not removed in the cleaning operation was left.

Fig. 3. Shows how tubes looked thru top manhole after chemical cleaning operation was completed.

Case 7 — Tennessee Power Plant

Chemical Cleaning Reduces Fuel 35%

ADVANTAGES of chemical cleaning of boilers and heat exchange equipment are rapidly becoming known to small power plant operators throughout the Tennessee Valley area. Many small industrial plants do not have highly trained personnel to operate and service boilers and thus are sometimes slower in learning of new developments in power plant maintenance — such as chemical cleaning. Also some plant operators are wary of chemical cleaning because they have had costly experiences from attempts by untrained and unqualified personnel.

Properly conducted chemical procedures leave the entire heat exchange surface of a boiler clean, whereas with mechanical cleaning it is virtually impossible to reach such areas as water legs, headers and tube sheets. Pitting and other defects which may have occurred from oxygen corrosion and scale are usually brought to light and can thus be corrected.

Costly "downtime" can be reduced to a minimum since most chemical cleaning operations, depending upon the type of scale deposits to be removed, can be completed in a 24 hour period. However, some types of scale deposits do require a longer time. A careful laboratory analysis of the scale and the thickness of the deposit to be removed determine the chemical solvents to be used and the length of time required for cleaning.

After the cleaning has been completed, an adequate feedwater treatment program should always be inaugurated to prevent the recurrence of scaling and corrosion of the heat exchange surfaces.

A fairly typical example of the value of proper chemical cleaning and proper feedwater treatment is the experience of the George Maloney Home, Knoxville, Tennessee. Water Services, Inc. of Knoxville, Tennessee was successful bidder on the chemical cleaning and feedwater treatment on the two 60 hp Kewanee firebox boilers located in this institution.

A careful internal inspection of these boilers showed a very dense scale varying from ¼" on the tubes up to more than one inch thickness in some parts of the water legs. Fig. 1 shows the condition of the tubes as seen through the top manhole while Fig. 2 shows the thickness on other heat exchange surfaces.

Laboratory analysis of the scale showed it to be largely calcium silicate. No feedwater treatment had been used for two years and prior to that time an inadequate treatment had been used. Scale deposits had formed on the heat exchange surfaces. Several hundred dollars had been spent each year in "rattling" the tubes in an attempt to remove the scale and to repair leaks resulting from overheating the boiler due to the scale deposits.

The laboratory analysis of these scale deposits indicated that a preboil would be necessary before the chemical solvents to be used could

be fully effective. Since they had a stand-by boiler and "downtime" was not a factor, this preboil was conducted for 96 hours, after which the chemical cleaning operation was completed in 48 hours. Approximately 90% of the scale deposits were removed in the cleaning process. The condition of the tubes after cleaning is shown in Fig. 3.

A thorough chemical analysis was made of the raw water, feedwater, boiler water and condensate and a properly formulated feedwater treatment program was inaugurated. Internal inspection of the boilers indicate that at the end of nine months of treatment, most of the remaining scale deposits left after the cleaning operation have now been removed from the heat exchange surfaces.

Regular monthly service tests are made by a field representative of Water Services, Inc., and necessary adjustments are made in dosage and blowdown as feedwater fluctuations and load conditions warrant. Corrosion throughout the old return lines, traps and heaters has been virtually eliminated.

A careful analysis of fuel requirements this past winter indicates a 35% reduction in fuel consumption. This 35% reduction in fuel costs, resulting from removal of scale deposits, will more than pay the cost of the chemical cleaning and the first year of feedwater treatment, not to mention the reduction in replacement of return lines, traps and heaters. In addition, assistance has been given the boiler operators in proper washing and maintenance of the boiler plant.

By S. S. CASSELL
Water Services, Inc.
Knoxville, Tenn.

Case 8 — Florida Processing Plant

Waste Water Cleaned

SNIVELY Groves, Inc. of Winter Haven, Florida processes and packs high-quality orange and grapefruit products under the well-known Cypress Gardens label.

This firm wished to cooperate with local and state Boards of Health in helping to stop stream and lake pollution in Florida. This problem has become acute in the last few years with an ever-increasing number of new industrial plants settling in the area.

The treatment of waste is often a costly process and the Snively Groves, Inc. sought the most economical means of screening their citrus-waste water. This waste material, if not properly treated, becomes stagnant, causing disagreeable odors. Bacteria growths form in the water bodies receiving such waste with a resulting health menace.

Realizing the seriousness of the problem, the firm installed a stainless steel 48-inch diameter SWECO Vibrating Screen Separator to help remove citrus-waste from discharge water. This unit is equipped with a 20 mesh stainless steel screen cloth.

The Separator handles the plant's water flow of 600 gallons per minute while scalping off the undesirable bacteria formations and citrus-waste solids. It has operated in a continuous circuit with negligible maintenance. Operating costs have also been very small due to the low power requirements (unit employs a 1 hp motor). The waste water that flows into the streams and lakes is now satisfactorily clean and free of waste.

W. W. Giddings, Vice President in charge of Research and Development of the firm, said: "We have found this Separator indispensable in our industrial waste handling." The Company also reports particular satisfaction with the ease of installation and compact size of the screening device. The unit requires no special attachment to platform since no vibration is transmitted to its base.

The Separator described has performed successfully in many industrial and municipal waste disposal operations.

By G. E. STINSMAN
Atlanta, Georgia

SWECO Separator performing low-cost citrus-waste screening at rate of 600 gpm through 20 mesh stainless steel screen cloth. Undesirable stream and lake pollution has been completely eliminated.

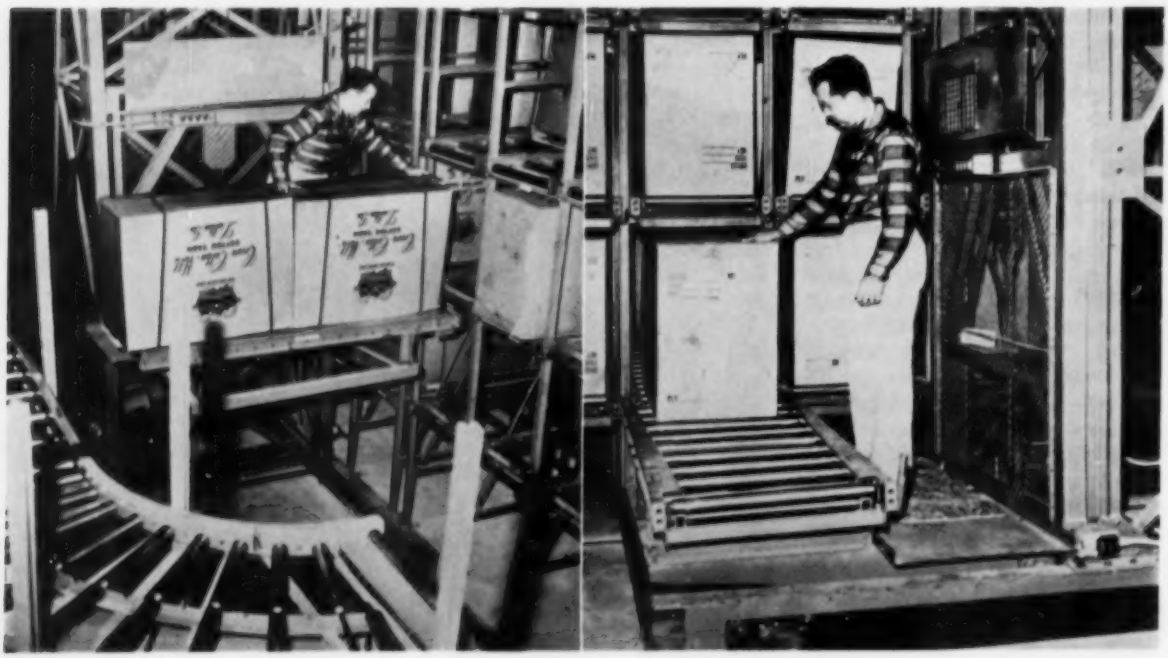
Side and high end of rack handling 300 lb cartons on ¼" plywood pallets. The 60 ft long conveyor lanes are sloped so packages move by gravity. Note optimum use of storage space.

Case 9 – Georgia Cotton Mill

Live Storage Controls Inventory — Saves Space

AN EXTENSIVE live storage rack system, engineered and built by The Alvey-Ferguson Company, Cincinnati, Ohio was recently installed at Crown Cotton Mills in Dalton, Ga. The system automatically provides fool-proof first-in first-out control of stored yarn — important because dyed lots must be kept together in order until final shipping. The rack also sharply reduces space requirements. Actually, before the rack was considered, Crown planned on a larger building. However, using

Traveling lift (left) is discharging carton into selected rack lane. Cartons have just been fed onto lift from gravity line curve in foreground. In photo at right, lift is receiving cartons. Stop in rack has been thrown down to allow carton to roll on transfer section.



the rack, the building could be made considerably smaller, and the savings in construction costs paid for the rack. The resulting economies in efficiency were realized from the very first day of operation.

The live storage racks consist of many units of gravity roller conveyors mounted in an adjustable rigid frame. These 60 ft long conveyor lanes are sloped so that packages of yarn move freely by gravity to the front of the rack where they are readily accessible for selection and shipping. Loading is performed at one end of the rack, unloading at the other. While these storage systems often are made with skate-wheel conveyors, roller conveyors were used because of the weight, bulk, and softness of the carton.

Another important advantage is the fool-proof organization it establishes. This cuts down tremendously on expensive supervision, makes inventory-taking an extremely simple procedure.

Unique loading devices load and remove cartons on opposite sides of the rack. These consist of elevators (vertical lifts) which traverse the face of the rack on rails, permitting quick mechanical access to each storage lane. This system makes it possible to build the rack almost to the ceiling, making optimum use of space.

The rack manufacturer reports that, besides yarn and other textile products, A-F live storage racks and systems have been used to store a wide variety of items such as nuts and bolts, huge loads of palletized firebrick, kitchen cabinets, phonograph records, office furniture, drugs, etc.

Variable Speed Pays

Case 10 — Georgia Industries

MANY production machines that could use variable speed drives to advantage are still operated at constant speed.

A variable speed drive having the proper speed ranges enables the operator, through experience, to find the exact optimum speed that assures both top quality of product and maximum machine efficiency.

Variable speed drives are also obviously well suited to production machines where synchronization is necessary between two or more machines. Also it is now recognized that many production machines must run at many different speeds in order to accomplish the full purpose for which they were designed.

In the textile mills during the last few years, we, at Pye-Barker, have switched a large percentage of spinning, twist and roving frames, as well as other textile equipment, over from fixed to variable speed drives. Likewise, we have furnished a number of variable speed drives for heating and air conditioning equipment. Many other industries should consider variable speeds to better serve their interests.

One of the more economical and practical methods is the use of a vari-pitch pulley mounted on motor, a sliding baseplate for changing location of motor when diameter of motor sheave is changed, and an appropriate belt. There are several well known manufacturers of this type of equipment (see photograph).

A well known Atlanta chemical manufacturer recently had us make recommendations for a 7½ horsepower drive of this nature. The machine being powered was an agitator that had a constant speed although different products were formulated in the same tank.

One product dictated the use of a slower drive due to density although other products could be handled at a much greater rpm of agitator shaft.

We delivered a drive of suitable horsepower requirements and variable by a ratio of three to one. Equipment has now been installed and is operating most satisfactorily. The company plans to install at least one more in the very near future.

By R. S. CONNATSER, Manager — Outside Sales, Pye-Barker Supply Company, Atlanta, Ga.

Vari-pitch pulley on motor with sliding base plate.

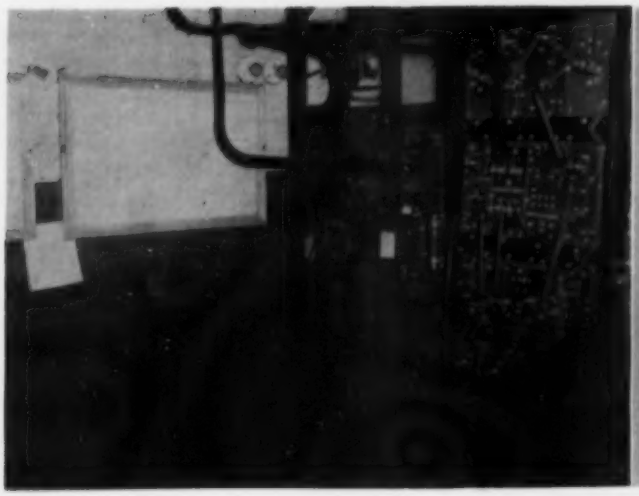


Fig. 1. Section of back side of control panel. Drawings mounted on wall at left. Sound powered telephone outlet is at bottom.

Fig. 2. Section of the front side of control panel. Metal tags show drawing designations.

Case 11 – Virginia Foundry

Control System Designed to Reduce Maintenance

By JESSE L. BAKER, Chief Electrician, Lynchburg Foundry Company, Radford, Va.

THE Lynchburg Foundry Company, Radford, Virginia, plant normally has several tons of molten iron in process which needs to be kept moving to assure continuous production and minimize loss of metal due to cooling.

Control systems are subjected to rugged service due to heat, moisture, dirt and cycles of service.

Design and layout of our control system for an effective preventive maintenance program has resulted in a substantial reduction in the number of breakdowns. However, some minor troubles do occur during operating hours. After careful study we found only a fraction of the downtime was used in making the actual repair. Most of the time lost was used in trouble-shooting to pinpoint the actual trouble.

Each control system was analyzed and the following needs recognized.

(1) Simplified method of wiring and identification of control components.

(2) Standard trouble-shooting procedures with complete information for each control available near the control.

(3) Standard inspection procedures.

(4) Regular cleaning schedule.

(5) Intensive training program to familiarize maintenance personnel with specific functions of various components.

In the pipe manufacturing department where cast iron pressure pipe is made, our main motors and controls are direct current because variable speed is needed in the operation. However, some auxiliary components are a-c.

Main control panels are mounted in a dust tight room and fresh air to dissipate resistor heat is brought in through fiberglass filters. Fig. 1 shows a section of the back control panel.

Elementary diagrams of control panel are made up to JIC standards and included on an E sheet with the panel drawing. Multiple conductor cables are used for control wiring with each cable numbered and wires within each cable numbered and color coded for quick identification.

Multiple conductor cables are terminated in a junction box near the various components to be connected. Junction boxes are made up with terminal strips and the same color coding and numbers are carried through. (See Fig. 4.) Color coding and numbering is carried to pushbutton and all other terminals to assure proper identification of each wire.

Drawings with color code data and numbers are placed in a picture frame and posted near the

controls. (See Photograph No. 1.) A small sketch with numbers to show cable locations are placed in each junction box in cellophane folders.

When trouble is reported, trouble-shooting is started from the control room. With the aid of drawings an analysis is made of the trouble and the suspected circuit is tested.

A ringing circuit terminal is provided at each panel for continuity and ground testing. Then with sound powered telephones, two electricians, one at the main panel and the other to follow through, can trace the trouble to the faulty component and correct it with a minimum of lost time. An outlet for sound powered telephones is provided at the main panel, junction box, motors and pushbutton stations.

Terminals and contacts are inspected weekly. Megger and ohmic resistance of parts are checked.

Control room, junction boxes and pushbutton stations are cleaned weekly with a vacuum cleaner using standard switchboard attachments.

In our apprentice training program we are using a standard electrical training course. At the proper point in the course, classroom instruction is given in the specific control and each apprentice is required to write the complete sequence of circuit operation using the numbers on the panel drawing. Then when downtime permits, they are given a simulated trouble-shooting project.

Case 12 — Florida Chemical Plant

Burner Performance

OUR two 8 x 80 ft Allis-Chalmers dryers are fired by four No. 12 Ray burners. Units operate in extremely dusty conditions. Dust and oil leakage from a ring oiled bearing on the burner motor was taken thru the suction to the 24 in. fan used for atomizing the fuel oil. This caused a build-up on the fan and entire air duct, resulting in loss of burner efficiency and expensive dismantling and cleaning.

To overcome this maintenance problem, we slowly add one pint of solvent to the suction of the burner at 8 hour intervals. This thoroughly cleans the fan and entire air duct while the burners are in normal operation.

By B. L. BLACKWELL, Drying Superintendent, The American Agricultural Chemical Co., Pierce, Fla.

Fig. 3. Control panel using standard combination starters and relays. Drawings mounted on wall opposite control panel. This room is cinder block construction and requires space only three feet wide.

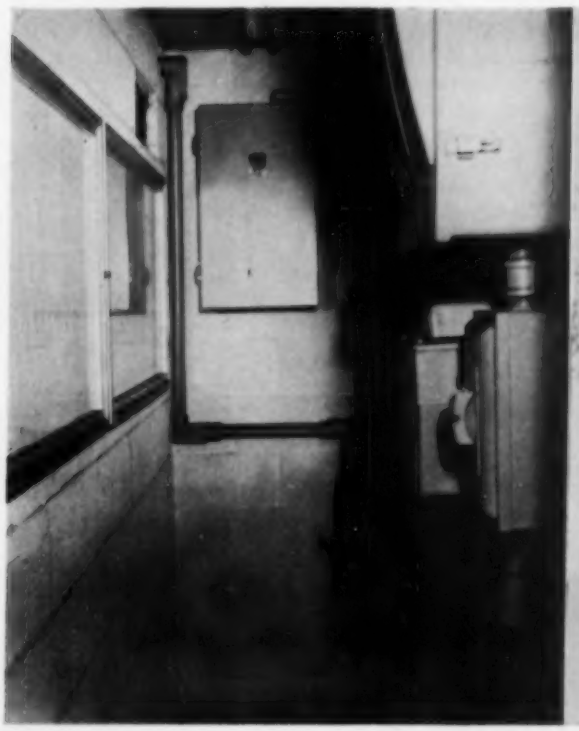


Fig. 4. Junction box with terminal strip, all wires are accessible and easy to identify. Sound powered telephone outlet at right. Brackets on door at left hold cable numbers and color code data.

Warehouse service aisle showing service conveyor.

Case 13 – South Carolina

Better Service Center

THE WHOLESALE drug business, even though its products are small packaged articles, is possessed of many problems in its functional operation.

The nature of the products in many cases requires cleanliness and moderate temperatures. Deliveries are quite often in small lots where cost of handling is a major item. In warmer climates air conditioning in the general offices and some method of moderate cooling in the main warehouse area is needed to promote efficiency and to protect merchandise stored in the warehouse area.

The planning, design and engineering incorporated in the entire plant of the Smith Wholesale Drug Company at Spartanburg, S. C. is unique in all these features and is a departure from the conventional distributing center.

Products are received in reasonably large shipments. These shipments must be sorted and placed in numerous bins. Shipping is a reverse cycle. Orders in small and medium lots are gathered from the numerous bins in the warehouse area, brought to a central shipping point and loaded on delivery trucks.

This operation of receiving, warehousing and shipping was an important factor in the overall design of the building and its relative arrangement.

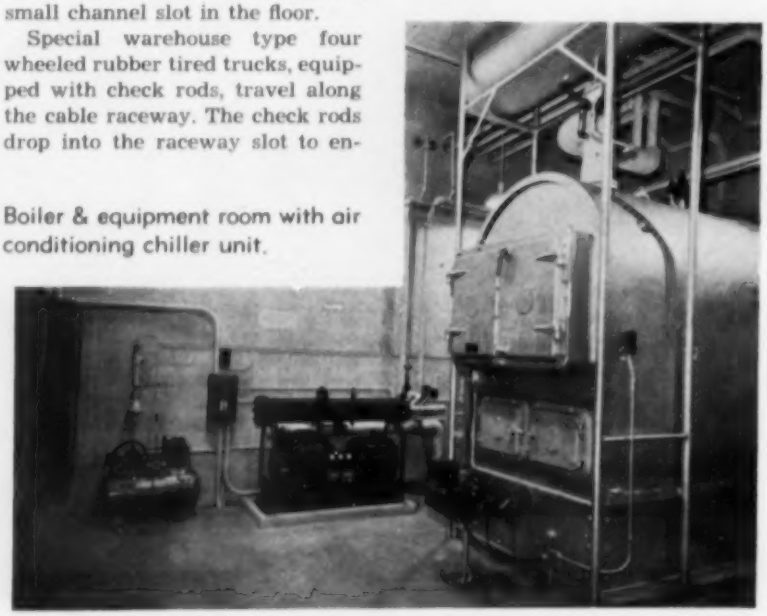
Mutual knowledge of owners and designers and study of operations was co-ordinated to develop a conveyor system to serve receiving and distribution to the warehouse bins, then picking up from same bins and delivering to shipping room and platform with a minimum amount of handling.

This 2-way handling was accomplished by the use of a specially designed traveling cable with check lugs at uniform spacing. This cable travels in a raceway below finish floor, directly below a small channel slot in the floor.

Special warehouse type four wheeled rubber tired trucks, equipped with check rods, travel along the cable raceway. The check rods drop into the raceway slot to engage the lugs on the traveling cable.

The traveling cable was routed continuous from the receiving area to the shipping area through main aisles in and around the storage bins. Any truck can be disengaged from the cable by lifting the check rod, making the truck free to be rolled down any bin aisle.

This conveyor and truck system eliminates all bulky handling of products by hand anywhere in the warehouse. This limits hand handling of merchandise to the loading or unloading of packages on and off the trucks.



Boiler & equipment room with air conditioning chiller unit.

Principal Equipment and Designers

Air Conditioning Equipment	The Trane Co.
Ventilation Units	Silco Products Co.
Controls	Minneapolis-Honeywell
Electrostatic Filters	Electro Air Cleaner Co.
Boiler	National Radiator Co.
Pumps	Bell & Gossett Co.
Conveyor	Towveyor Co.
Architect	A. H. Chapman, Jr.
Mechanical Engineer	J. C. Harrison
General Contractor	Triangle Const. Company
Mechanical Contractor	W. N. Kirkland, Plumbing & Heating Cont.

The Administration area was planned so that office routine would be streamlined.

The problem of cleanliness was complicated by the fact that in a warm climate the area must be ventilated. Force ventilation was indicated, but it naturally introduces dust-laden warm air. Complete air conditioning was not essential; besides, it would have been impractical from a cost standpoint. Along with the ventilation, heating had to be provided.

To satisfy both of the above conditions, specially designed unit ventilators were suspended near the ceiling of the warehouse area with 100% fresh and return air dampers operating on the principal of differential thermostats. Each unit was equipped with electrostatic filters, having a filtering efficiency of 95%

At night during the summer, temperatures drop to the mid-seventies, while the daytime temperatures rise to the mid-nineties.

The control system was designed for the warehouse area to utilize cool night air to relieve the temperature build-up from high outside temperatures. This was accomplished by a system of control that automatically delivers cool night air into the building, cooling the building and contents to prevailing night-time temperatures. This cooled mass acts as a cooling medium during the daytime to prevent the inside temperature from rising above reasonably comfortable conditions. All the above operation is automatic, accomplished by the use of an inexpensive pneumatic control arrangement with standard control units. The results have exceeded expectations.

The heating cycle operates in reverse to the ventilating cycle, automatically utilizing natural outside conditions for heating when available and reverting to controlled heating as required. This method of control and making use of natural conditions materially reduces the overall cost.

The general offices are completely air conditioned, using mechanical refrigeration and conventional air conditioning units. A similar design of control was used for the office mechanical air conditioning as was used for the warehouse area. When outside temperature conditions are such as to provide adequate cooling effects only outside air is used. Varying outside temperatures are offset by modulation of a system of dampers to minimize operating cost.

The distribution system is completely zoned and individually zone controlled. Zoning was mandatory due to the widely different internal heat gain in the several office areas.

The results of careful planning throughout the design period and following through to completion has proved economical in both first cost and operating cost.

By J. C. HARRISON
Mechanical Engineer and Consultant
Spartanburg, S. C.

Pin breakage stopped on forming tool.

Case 14 — Missouri Metalworking

Pin Breakage Stopped

A MISSOURI metalworking firm eliminated an annoying and time-consuming problem of pin breakage when it tried a special alloy tool steel for a heavy duty wire-forming tool.

This pin takes a severe jolt as wire is bent around it to form wire products. A pressure of 1,800 lb is exerted and in a torsional shearing action. The wire formed is a half-hard basic wire ranging in size from 0.137" to 0.150" round.

After other steels proved unsatisfactory, the plant decided to use Carpenter Solar, a water-hardening tool steel with extreme toughness made by The Carpenter Steel Co., Reading, Pa. In a special demonstration, a 0.250" round pin of Solar bent without breaking, even when hardened to Rockwell C-58/60. Another Solar pin was then ground to 0.195" round and used for the forming tool. Approximately 3/16" of the 1" length is exposed to the shock in operation.

The Solar pin has produced 150,000 formed wires, and is expected to produce another 150,000. Best performance of any pins made previously from chrome-tungsten steel, drill rod and oil-hardening tool steels was about 25,000 pieces.

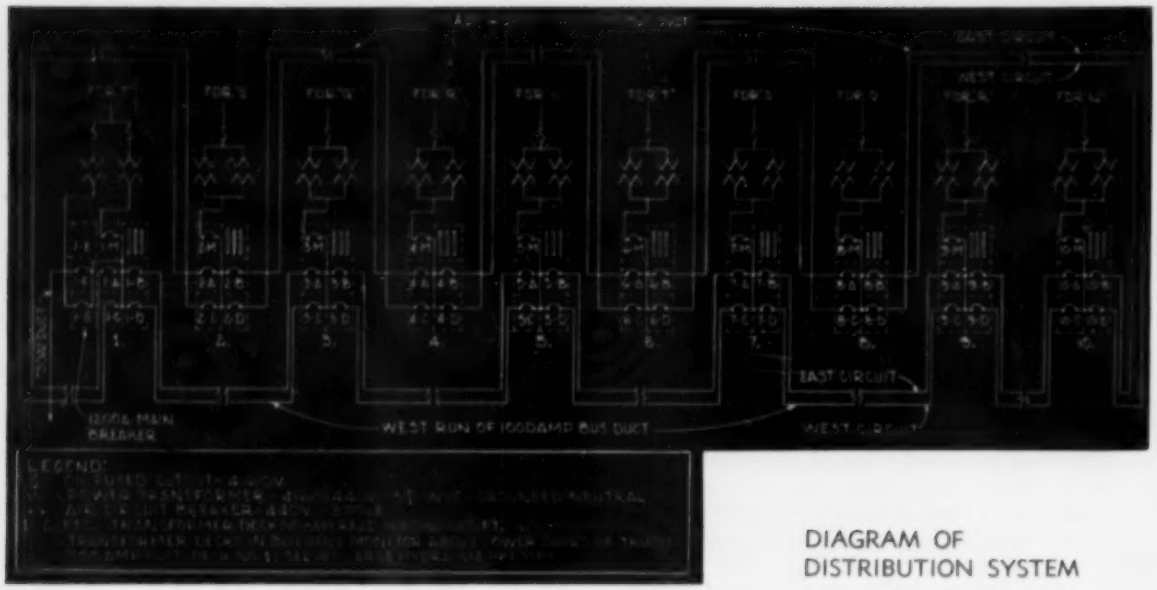


DIAGRAM OF DISTRIBUTION SYSTEM

Case 15 — Texas Aircraft Plant

Electrical Distribution System Capacity Increased

By F. C. CLAYTON, Chief Plant Engineer, Convair, a Division of General Dynamics Corp., Fort Worth, Texas.

WHAT shall we do when the electrical system just won't take any more? This is a situation facing many industrial plants today. Here is how it is being solved at Convair's Fort Worth plant.

The parts manufacturing plant, containing most of the fabricating and tooling machine tools and process equipment, is served by a "plug-in" bus duct network system. This consists of ten transformer decks located overhead, with air circuit breaker network protection. The bus duct is 1000 ampere double circuit (500 ampere bus bars). Switches up to 400 ampere size can be plugged in to serve almost any machine or building load (see diagram).

Five 4160 volt feeders serve the 10 decks, arranged as shown. As originally installed in 1942, each deck was equipped with one 600 kva air cooled transformer, except deck No. 1 which had two. Feeders, fuses, circuit breakers and bus duct, however, were generously sized.

The first time there was a power shortage, an economical solution was found by paralleling the 600 kva transformers on decks 2 through 10 with 300 kva units. The only special requirement was careful matching of voltage ratios and impedance. This is the arrangement shown in the cut.

Acquisition of several new spar mills and skin mills with as much as 450 horsepower each has again caused a power shortage. A study of switch and bus capacity indicated that 1000 kva per deck maximum could be installed. This was not enough margin over the 900 kva already installed.

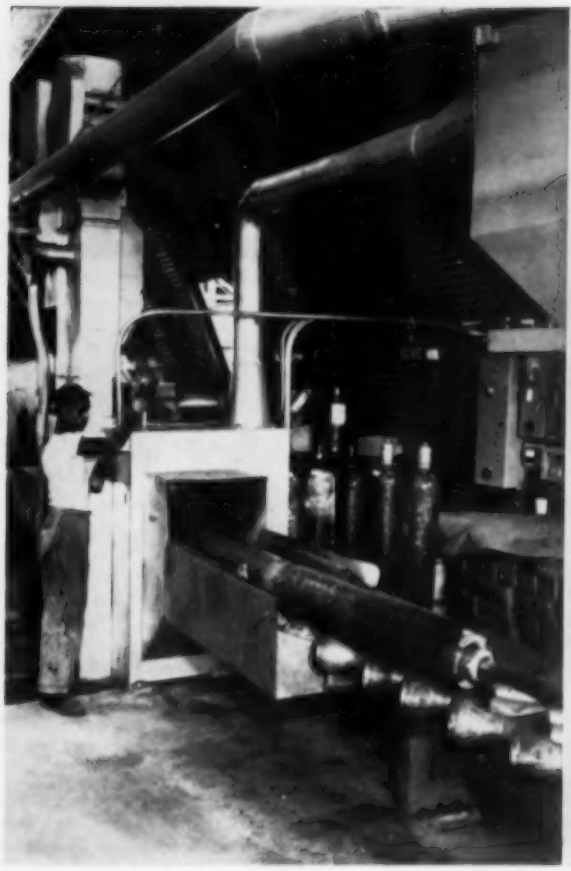
A study of all loads fed from the network showed fixed loads consisting of an average of 200 kw of lighting and 4-40 hp ventilating fan motors per deck. Since all wiring for these is also in the roof trusses, removal of these loads from the duct system could be accomplished at minimum cost.

The plan finally adopted was to buy 4 new 1000 kva transformers for the decks closest to the heaviest loads. This left free 4 — 600 kva and 4 — 300 kva transformers. The 4 — 600 kva were installed on the same decks with radial distribution to fixed lighting and fan loads. By thus adding 400 kva capacity to the network, and removing approximately 340 kw load per deck, or 1360 kw, the capability of the network has been increased by 1760 kva. This same method can be applied to five more decks when and if needed.

Two new 4160 volt feeders from the main substation were required. Heavier feeders were installed and applied to the network system. The two old feeders were then used to serve the 600 kva transformers.

The 4 — 300 kva transformers left over are available for use elsewhere, or can be used on other decks to serve fan and lighting loads.

A contingent benefit has been separation of lighting and ventilation in some areas from the machine load system in this windowless, completely air conditioned building. Formerly, if an outage occurred on one deck or feeder, the system would sometimes "domino" — successive decks tripped out as they tried to absorb the load on the loop. This would leave the entire building without lights or air conditioning.



Corroded cylinders on the entrance conveyor of the Wheelabrator cabinet. One man is used for loading and another for removing the cleaned cylinders.

Operator removing a cleaned cylinder from the conveyor of the Wheelabrator Cabinet. Only 24 seconds were required to clean this cylinder.

Case 16 — Maryland Oxygen Company

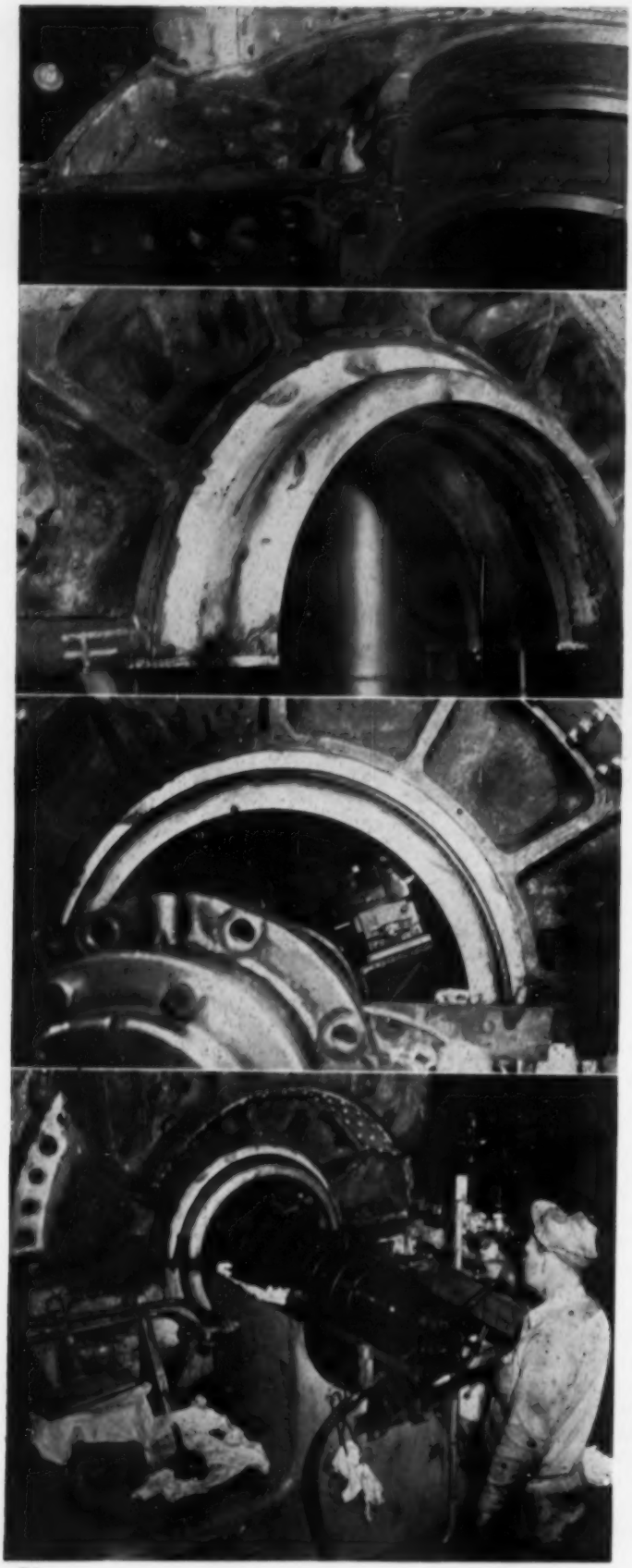
Day's Production Now Done In Ten Minutes

WITH MORE than 90,000 gas cylinders in service, Southern Oxygen Company, Bladensburg, Md., needed to find an effective method of cleaning and reconditioning. Cylinders were cleaned by caustic washing at a rate of 20 cylinders per man per day. This method was time-consuming, messy and if the cylinder was extremely rough, ineffective.

A cabinet, manufactured by the Wheelabrator Corporation, Mishawaka, Indiana, was installed. This cabinet contains one centrifugal blasting wheel and a skew dished roll conveyor for carrying the cylinders through the blast area. As the cylinder passes through the blast cabinet, it is blasted by metallic abrasive. What was formerly a full day's production can now be done in from eight to 10 minutes.

The Wheelabrator method leaves a clean uniform etched surface that responds well to painting. Because all corrosion and old paint has been removed to the virgin metal, a good painting surface is provided.

Before and after. Note rust, scale, chipped paint and other dirt is completely removed from cylinders at left.



Case 17 — Texas Power Plant

Novel Machining Operation Eliminates Costly Repairs

THE CAST IRON casing on one of our older 7,500 kw turbines was warped to such an extent that it was impossible to hold it tight at the horizontal joint. This warping also made it difficult to get the radial bolts in or out.

Repairs were made by facing off the top half of the casing on a planer and inserting dovetailed steel plates held by Allen head screws as shown in the photo—top left. The top half was then used as a straight edge or surface plate to mate the bottom half of filing and scraping. New high and low tooth labrynth packing was also installed during this overhaul.

It was found that the bore for the packing case in the turbine casing was badly out of round and would have to be trued up. The packing fits the shaft with very close clearance so it must be true with the shaft.

Repairs were made by mounting an angle plate with lathe compound and tool to the turbine shaft. An air motor was mounted on turbine shaft to give variable speeds. The bottom half of thrust bearing was left in place as well as the No. 1 and No. 2 bearing halves. Oil for lubricating the bearing was obtained by connecting an air line to the turbine driven auxiliary oil pump. Since the shaft must run perfectly true while doing a job of this nature, bearing clearance must not be excessive.

By A. R. MORRISON, Master Mechanic, Southwestern Public Service Co., Amarillo, Texas.

Photos at left show steel plate secured to joint with Allen head screws; front of joint showing steel plates; lathe compound and tool fastened to shaft with angle plate; and air motor used to rotate turbine shaft during machining operation.

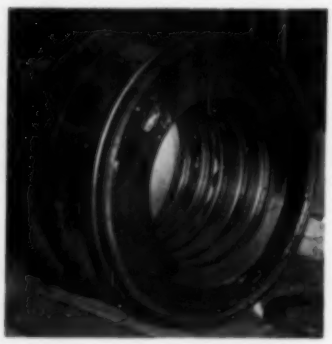


Photo at right shows high pressure labrynth seal packing case.

Case 18 — South Carolina

Water Cost Reduced

A CONSTANTLY attended water pumping station has been successfully converted to remote and automatic operation by the Celanese Corporation of America at their Celriver Plant near Rock Hill, South Carolina.

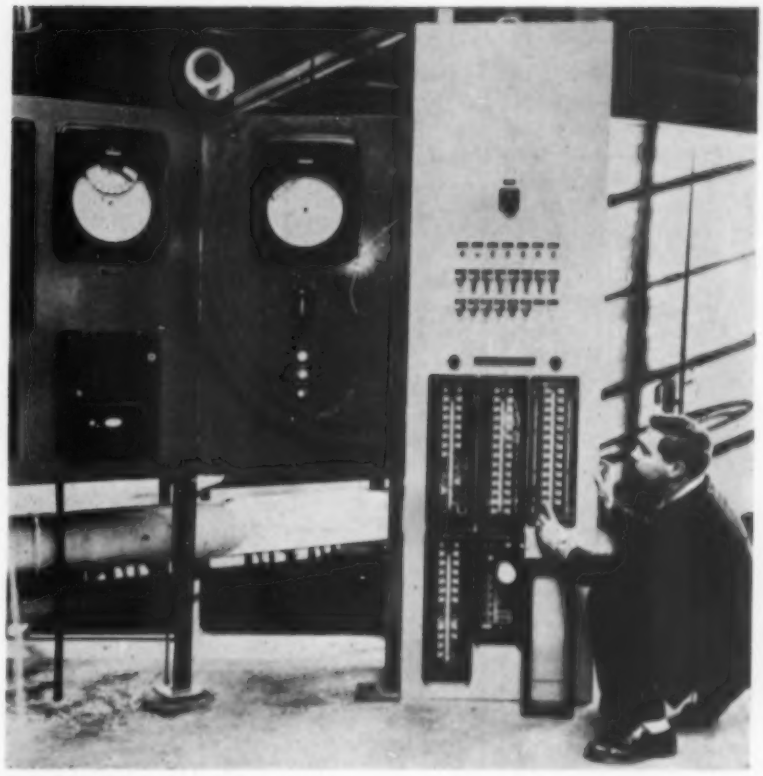
The Celriver Plant is engaged in the manufacture of cellulose acetate and acetate yarn and staple. Water for process cooling, boiler feed make-up, drinking and sanitary purposes requires a water system of 50,000 gpm capacity.

Five pumps rated at 10,000 gpm each are installed in the river pumping station located on the Catawba River approximately ½ mile from the plant. A one million gallon reservoir and a combination booster pumping station and filter plant are located at the Manufacturing Plant.

The original design employed manual on-off operation of the river pumps to maintain the level in the reservoir within set limits and required one operator per shift on a continuous basis. To reduce the amount of operator labor required, the river pumping station was converted to remote or automatic operation from the booster pumping station.

Supervisory equipment manufactured by the General Electric Company and usually employed to operate and supervise circuit breakers in sub-stations from a remote location was adapted to start and stop pump motors as dictated by the water level in the reservoir. Automatic or remote operation of the traveling screens in the river pump intakes was also incorporated in the control system.

The supervisory equipment consists of telephone type relays at the booster pumping station and river pumping station and is tied together by a pair of telephone wires. Coded impulses are transmitted by the supervisory equipment according to the operation to be performed and the corresponding coded relays at the outlying station are picked up and energize auxiliary relays which open or close the appropriate motor starters.



Supervisory Equipment at right controls five 10,000 gpm pumps ½ mile away.

When the operation is completed or the position of a control device changes at the outlying station, a code is sent back and relays operate indicator lights or alarms at the booster pumping station.

The entire system is monitored by a reservoir level recorder with high and low level alarms located in the booster pumping station which is constantly attended.

The use of the supervisory equipment has enabled operator time to be reduced to one inspection tour per shift. The automatic system has been in operation for approximately one year and has been satisfactory from an operating and maintenance standpoint.

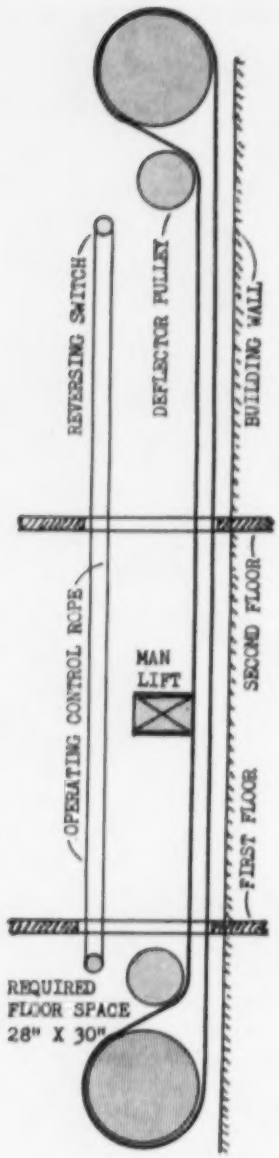
By H. M. SHANK, Engineering Dept., Celanese Corporation of America, Rock Hill, S. C.

Case 19 — South Carolina Hotel

Survey Shows Coal Economical

THE POINSETT Hotel, Greenville, S. C., recently decided to increase steam capacity by adding a new boiler in its power plant. At the time, management asked its consultants, The McPherson Company, of Greenville, to analyze costs of all three types of fuel available in that area.

On the basis of cost per thousand pounds of steam, the other two fuels proved to cost 25% more than bituminous coal. According to The McPherson Company, "The net result of this study indicated that by continuing with the use of bituminous coal the owners would save on both the initial investment and on operating costs."



Case 20 — Georgia Feed Mill

Unusual Man Lift

THE Tucker Feed Mill of Royston, Georgia had a space-problem coupled with a real need for a man lift.

They submitted to us a request that we engineer and produce a space-saver man lift, which would fit into the very limited floor space available. After studying their problem, and noting that the usual types of man lifts would not fit into the required 30" circular space, it was decided that a new type could be developed.

This space - saver man lift, shown on the drawing, operates both "up" and "down" on the same side of the belt. Only two floors are shown, but it would operate as well through any number of floor-levels.

The various switches, push-buttons, and safety devices are not unusual or complicated.

The job turned out nicely for our customer, solving his man lift requirement, saving his space, and saving him a considerable sum of money over a conventional type lift.

By H. FRANK LEONHARD, Chief Engineer, W. J. Savage Company, Knoxville, Tenn.

Case 21 — Georgia Repair Center

Castings Salvaged With Wire Inserts

CASTINGS valued from $4 to $90 are being salvaged from the scrap heap by The Gulf Oil Corporation at their regional repair center in Atlanta, Georgia, with stainless steel wire thread inserts.

Under the Gulf service station maintenance program, gasoline pumps are periodically removed from service for checking and a complete overhaul at the regional repair center. Frequently, the cast iron and zinc die castings that form the pump air eliminator, adapters and pressure chamber, were found to have damaged threads from incorrect field installation or mishandling in use. Since labor costs to repair a casting by the oversize thread method were often more than the casting was worth, all castings having stripped or worn threads were discarded as scrap.

With 18-8 stainless steel wire thread inserts, manufactured by the Heli-Coil Corporation of Danbury, Conn., Gulf now salvages all damaged castings at a minimum cost. During the last year, over 150 castings have been repaired with wire thread inserts. These inserts permit the use of the same size screw in the repaired hole as was used in the original hole. This eliminates any matching operations that would be necessary if oversized threads and cap screws were used to solve the damaged thread problem.

Use of these inserts also eliminates the need for drilling out larger clearance holes in mating parts. In addition, these preformed wire inserts provide threads that are stronger, more wear-resistant, and more corrosion resistant than the original threads.

How Insert Works

The thread repair is accomplished with this procedure: the damaged thread is cleaned out with a drill the same size as the original thread. The hole is then retapped, using a special Heli-Coil tap, and the Heli-Coil thread insert is installed.

In its free state, the insert has an outside diameter larger than the diameter of the tapped hole. The action of the inserting tool compresses the insert to slightly less than the outside diameter of this hole. Upon entering the tapped hole, the insert expands and permanently locks itself in place. For a through hole, the notched tang of the insert is bent back and forth a few times with pliers to detach it from the insert. Blind holes do not require removal of the tang.

Mr. Berry (right) with HumKo employee examining the Mason-Neilan regulator. Valve reduces steam pressure from 125 to 50 pounds for the safety of men operating a steam cleaner.

Case 22 — Tennessee

Steam Pressure Regulator

THE PROBLEM of providing safety with less expense was solved by the HumKo Company, 1702 Thomas Street, in Memphis, Tennessee, with the installation recently of a No. 11 Mason-Neilan reducing valve three-quarter inch regulator, supplied through E. C. Blackstone Company, widely known mill supply firm in Memphis and distributor for Mason-Neilan.

The installation has given HumKo greater efficiency and safety with an automatic regulator in use, rather than the manually-operated regular gate valve.

"We found that the regular gate valve could not give HumKo as close control as was required," explained Joe Berry, sales engineer for the E. C. Blackstone Company. "By installing the Mason-Neilan regulator this difficulty was eliminated and it gave new savings, too, since the regulator operates automatically."

The Mason-Neilan regulator was installed on a line that supplies steam for cleaning presses. It reduces the steam pressure from 125 pounds to fifty pounds for the safety of the man operating the steam cleaner.

Case 23 — Tennessee Water Works

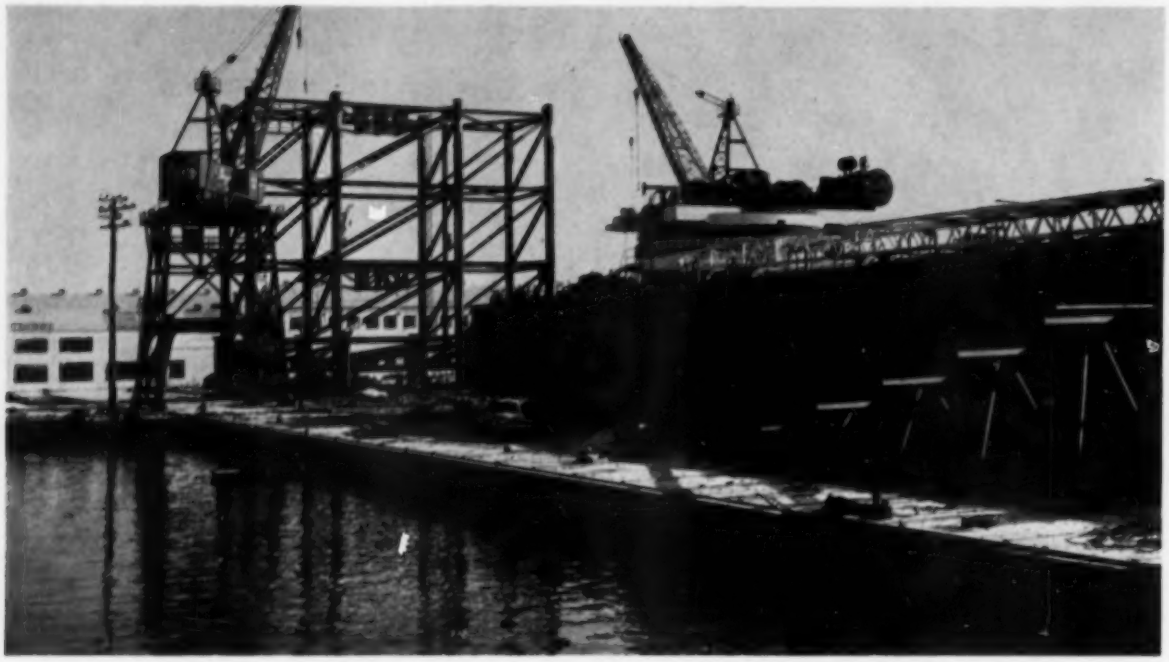
Cleaner Coolant Cuts Costs

AN EMPLOYEE'S cost reduction idea saved Memphis Works of International Harvester Co. an estimated $4,079.03 per year and earned the employee a $679.83 cash award.

Andy C. Thurber, process engineer, suggested installation of magnetic separators on all centerless grinders to separate metal particles from coolant. An Indiana Commercial Filters Corp. Magnetic Separator was tested on one grinder, and saved one and one-half man-hours per week in operator's time, sludge removal, and coolant replacement. Installed on six grinders — at a cost of $2,954 — the separators saved an estimated 468 man-hours per year.

In addition, coolant use was reduced 50%, and grinding wheel replacement was cut 10%, according to Herbert Anderson, head of the Production Research Dept., and K. K. Gowen, Jr., production research investigator. The plant normally uses 575 grinding wheels a year on its centerless grinders.

Andy C. Thurber (right) shows E. T. Crofoot, planning engineer, his cost reduction idea. Installed on six grinders at a cost of $2,954, magnetic separators save the company $4,079.03 per year. The company's New Ideas Suggestion Plan for employees paid Thurber one-sixth of the estimated annual savings.



New side launching facilities help Higgins to secure a dozen major jobs.

Case 24 — Louisiana Shipbuilding Company

Offshore Drilling Changes Launching Needs

AS OFFSHORE oil drilling activities increased, larger and heavier equipment was needed. Higgins Inc. of New Orleans, a major supplier of such equipment, was prevented from bidding on the larger jobs because of limited launching facilities. The need was to provide launching and loading out facilities for the bigger and heavier equipment.

The new side launching ways consist of twenty-four horizontal ways and twenty-four inclined ways twelve feet on center. Timber transfer cradles moving on a system of free rollers operate over the horizontal ways and on to the top chord of the steel launching cradles. There are twelve individual steel launching cradles which travel on the inclined ways by means of wheels mounted on the bottom chords.

Completion of the new ways enables the company to remain active in producing offshore oil equipment. The new ways have resulted in the company securing at least a dozen major jobs which it could not have handled before.

Case 25 — Georgia Textiles

Fuses Reduce Down Time

SEVERAL years ago we had a heating problem in our main panels that was causing ordinary renewable fuses to blow. These outages occurred several times weekly in each panel, so down-time costs were really adding up and costing our company money. Also, after each blow our maintenance men would spend time checking the circuit for trouble, only to find the outage was caused by excessive heating in the panel.

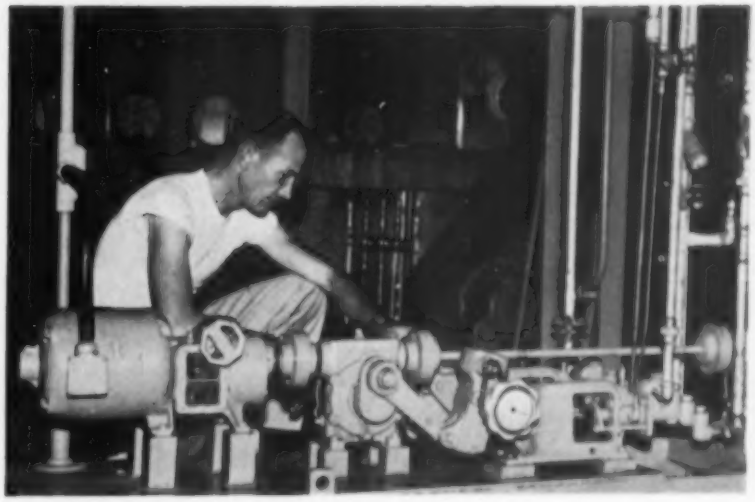
We discussed the situation with a salesman and he showed us that Fusetron dual-element fuses were cooler operating and would eliminate our trouble. The change was completed and we haven't had any unnecessary shut-downs since then.

Our maintenance men like the change. Any outage today indicates trouble, and the men know they are not wasting time when they check the circuit. Because of this and other satisfactory experiences with Fusetron fuses, we individually protect all our motors with them as well as using them throughout the rest of the electrical system.

I wish we had kept a record to show how much money we saved. I am reasonably certain that the difference in motor burnouts alone would represent considerable savings.

By J. W. SAUNDERS, Chief Electrician, Rosemary Mfg. Co., Roanoke Rapids, N. C.

An operator at Springs Cotton Mills' Grace Bleachery, Lancaster, S. C., changes the capacity of liquid end of Milton Roy three-cylinder formulating pump with the controlled volume pump's dial adjustment device for fast, accurate changes in chemical ratio. Capacity outputs of all liquid ends are simultaneously varied by manual motor speed adjustment.



Case 26 – South Carolina Cotton Mill

Chemical Formulators Speed Process

CLOTH used to be bleached by the batch operation, or kier bleaching. This involved a long and difficult cycling operation. It was first boiled under pressure for 8 to 15 hours in a caustic soda solution, rinsed, then bleached for 4 to 8 hours and finally rinsed again.

Drawbacks to the process included use of an excessive amount of steam, high unit cost of production, excessive time element, and non-uniform bleaching.

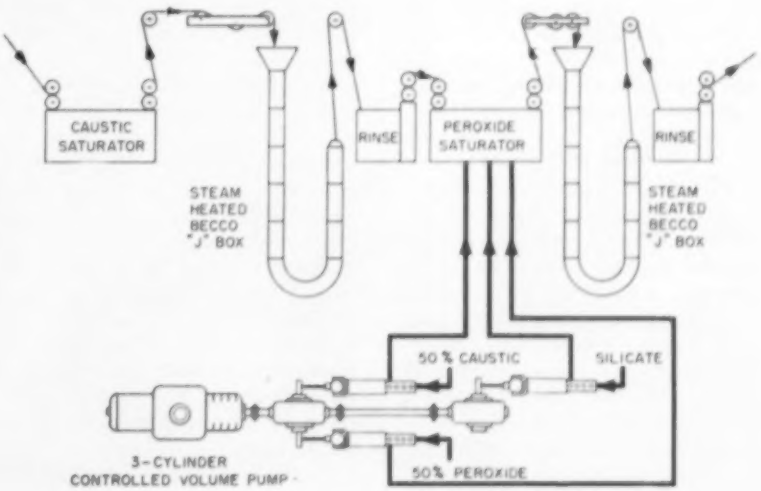
Today, chemical formulators speed continuous bleaching and reduce chemical and operating costs.

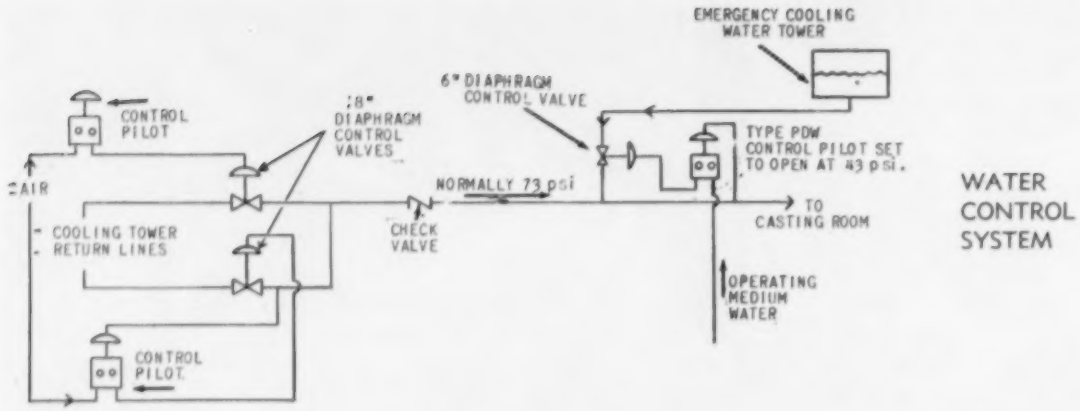
At the Springs Cotton Mills, Lancaster, S. C., makers of Spring Maid Fabrics, continuous, automatic cloth bleaching is successfully accomplished through the use of Milton Roy three-cylinder formulating pumps. These pumps at the Grace Bleachery feed 50% caustic, silicate and 50% peroxide solutions to the peroxide saturator with one variable speed motor to drive the three liquid ends. To match the speed of the cloth through the bleach range the pumps are equipped with manual motor speed adjustment. The stroke length of each liquid end is individually adjustable so that each solution can be fed at a specified rate to obtain the desired ratios between chemicals.

Two saturating baths, one for caustic and one for peroxide are used with Becco J-boxes and rinsing baths in the bleach range. The three-cylinder formulating pumps maintain the peroxide saturating bath at the proper solution concentration.

Through the use of these controlled volume pumps, cloth is continuously bleached at the rate of 50 to 250 yards per minute. With the batch process, it took 16 to 24 hours for the treatment of a single batch.

Controlled volume formulating pumps control three flows in proportion to each other, while varying the set proportion to vary all three flows in accordance with the variable speed of the process. With continuous accurate metering of chemicals, perfectly uniform bleaches are obtained with a minimum of attention and increased plant productivity. Not only is cloth processing much faster now, but bleaching costs are drastically lower than the costs of bleaching cloth in batches — with successful operation. The Grace Bleachery of the Springs Cotton Mills now has five formulating pumping units.





Case 27 – Louisiana Aluminum Plant

Process Control for Aluminum Plant

THE CHALMETTE Works of the Kaiser Aluminum Corporation at Chalmette, Louisiana is another addition to the growing list of process-industry users of automatic controllers and regulators.

Creole Engineering, New Orleans, La., made the installation of Leslie Co. equipment at the metal refining plant, consisting of one 6" reverse-acting diaphragm control valve, one direct-acting pressure control pilot, two 8" and two 1½" direct-acting diaphragm control valves, four reverse-acting pressure control pilots and two 1" air-to-open diaphragm control valves. Delivery was completed in the latter part of 1956, and all units are reported to be performing satisfactorily controlling gas and cooling water services to casting room processes.

Control of Process

This plant is one of the larger aluminum refining plants in the United States, and the above equipment has been installed to provide a method of precisely controlling their process conditions during refining operations. The 8" control valves regulate the flow of water returning from the cooling towers; the 6" control valve regulates the flow of emergency cooling water (see diagram). The 1¼" control valves reduce the 60 psi pressure of supplied gas to the desired 20 psi; the two 1" diaphragm control valves are also used on the natural gas lines.

Processing Problem

The refining operations and process condition requirements at this plant, although varying in some respects from other processors, are indicative of the requirements of other metal processors engaged in similar operations.

As illustrated in this specific problem, even the most exacting requirements for the control of process conditions can be satisfied by selecting the correct equipment from the large number of controllers and regulators available today.

Creole Engineering pointed out to this metals company how the adoption of an automatic system of controls would accomplish two desirable purposes; it would assure the manufacturer that his process conditions would be satisfied better with an automatic system than by using operators to make adjustments indicated by changing requirements; and the manpower released by the use of this system could be used profitably elsewhere in the plant.

In this installation a dependable supply of cooling water to the casting room was a most critical factor, and the water had to be supplied at a minimum pressure of 40 psi. At the suggestion of Creole's engineers, the old system, of having a low pressure alarm and assigning a man to cut in the emergency cooling water line at the sound of the alarm, was rejected in favor of an automatic system. A direct-acting type control pilot was connected to the cooling water supply line and to the 6" diaphragm control valve.

In operation, when the cooling water pressure falls below 43 psi, the pilot automatically opens the 6" valve on the emergency cooling water supply line and water from the emergency cooling water tower is fed to the casting room. Similarly, when the regular cooling water supply resumes its normal pressure of 73 psi, the pilot closes the 6" valve.

A similar arrangement, but using reverse acting pilots and 8" diaphragm control valves, is used to regulate the pressure of the regular cooling water supply line.

Consulting and operating engineers interested in improving process condition control may find similar solutions to their problem by working with factory-trained local representatives of dependable engineering concerns experienced in this particular field.

Regulator and controller manufacturers have trained representatives in most major cities who can provide technical advice which should not be overlooked.

Bales of nylon, blended wool and cotton are stacked by Automatic Transportation Company's Dockers in the 18 ft high raw material warehouse.

Case 28 — Virginia Carpet Factory

Savings With Fork Trucks & Collapsible Wire Boxes

ONE OF THE nation's most modern carpet weaving plants — James Lees and Sons Company — spreads over a 100-acre tract at Glasgow, Virginia. Having all this room has induced this factory, which produces $75 million in carpets annually, to make the most of it.

Contributing in no little way was its integration of four Automatic Dockers, Model FFE-20, industrial fork lift trucks some six months ago.

And the thing that's bringing the smiles to management's face is Tom Faulkner's prediction that the trucks will pay for themselves in two and a half years. Mr. Faulkner is the company's receiving and supply department manager.

The saving is going to be realized through the elimination of cartons, not through cutting manhours as is generally the case.

"By using Palletainers (collapsible wire boxes) instead of cartons we have created space by going to vertical storage that has reduced bottlenecks and improved inventory control and delivery of needed items," explains Mr. Faulkner.

Before the fork lift industrial trucks came to Lees' plant, goods were handled by hand truck in the plant and in automobile trucks between some departments. The yarn was held in containers measuring 24 x 40 x 30 in.

Now yarn is handled in collapsible Cargotainers, wire baskets measuring 40 x 48 x 30 in. A common load for a fork lift is three of these stacked atop each other and weighing between 500 and 1,500 lb.

The very nature of Lees and Sons' plant calls for long load hauls — anywhere from 50 to 2,000 ft between departments. The Dockers are kept on the run 24 hours a day, six days a week, usually by assigned and trained operators. Naturally, this requires three different operators per truck every 24 hours.

Lees' plant is a one-story structure. The mill covers approximately 1,000,000 sq ft. Ceilings are 18 ft high throughout. The raw materials are received from rail cars having entry to the plant on a siding which is more than a half mile long and from trucks which are received at four separate docks which can provide for eight to 10 trailers at a time.

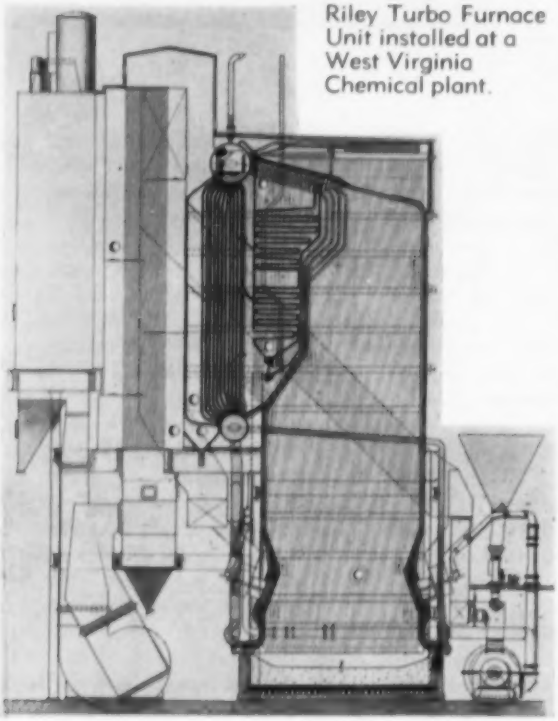
Carpets are shipped in veneer cases and are handled by monorail cranes. Several different older types of fork lifts round out the company's aggregate of mechanized materials handling equipment.

It's Palletainers on top of Palletainers as the fork lift truck adds three more to the neatly 5-high tiered rows. At the right a Docker truck loads two cartons of Lees' narrow carpet rolls onto truck at inside dock.

Case 29 — West Virginia Chemical Plant

Fly Ash Refiring Solves Disposal Problems

THE RAPID expansion and growth of power plants at a West Virginia chemical plant created a tremendous fly ash disposal problem. With disposal costs running as high as $1.75 per ton and future disposal costs even higher because pumping equipment would be required to convey fly ash over adjacent ranges of hills into new low lying areas.



Riley Turbo Furnace Unit installed at a West Virginia Chemical plant.

When the need arose for additional steam capacity, studies were made to eliminate the ever increasing fly ash disposal problems by refiring ash into a properly designed boiler unit. As a result of these studies and experience of other plants a slagging bottom evolved.

The boiler unit has a rated capacity of 289,000 lb of steam per hour at 615 psig, 670 F temperature. Inclined adjustable burners are arranged for opposed firing to promote maximum turbulence with the higher temperature zone in the center of the hearth in a line parallel to the boiler drums.

Design efficiency of the unit was set at 87.0 but its performance has consistently been at 88.6 when operated at design steam flow.

Dust is collected from a gravity hopper below the last boiler pass from a mechanical separator after the air heater and from a vertically oriented electrostatic precipitator following the induced draft fan. Reinjection utilizes hot air from a separate single stage blower which picks up dust from hoppers for refiring to nozzles located between and below the rear wall coal burners.

Operating results achieved with this method of firing and refiring exceeded all expectations. Total stack discharge at 300,000 lb per hour steam flow is less than 0.5 lb per 1000 lb of flue gas. The unit does not require the use of soot blowers and deslagger equipment. The unit is tapped once a day. All ash is recovered as a slag which is readily disposable. The slag has been used for roads, driveways and is also being considered as a raw material in manufacture of building blocks, bricks, etc.

Case 30 — North Carolina and Alabama Plants

Correct Packing Application

IN A VIRGINIA dairy it was considered normal maintenance to repack bottle washing machines weekly because the braided asbestos packings which were used failed and came apart due to the solvents, chlorine and detergents used in the operation. The local Raybestos-Manhattan distributor suggested that the machines be packed with R/M No. 1845 "versi-pak," an R/M Type 1 Packing. As a result packing life was increased, and maintenance costs and downtime have been greatly reduced.

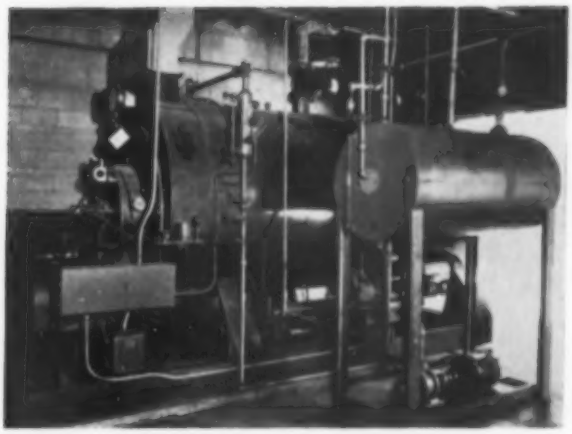
A North Carolina laundry was experiencing difficulty with ordinary braided packings due to leakage on solvent and feed water pumps. Raybestos-Manhattan No. 1840A "Universal" Plastic Packing greatly improved sealing with the additional advantage that packing does not harden in service.

At an Alabama foundry where centrifugal casting molds are placed together by means of built-in hydraulic jacks, Raybestos-Manhattan No. 1203 "Vee-Flex" packing rings have been installed. 40% to 50% more castings are now being produced between each repacking than when ordinary V-rings were previously used. The "Vee-Flex" rings seal against hot air at approximately 350 F and 1200 psi.

Similar savings are being made by many other Southern and Southwestern plants each of which use packing recommended for specific applications.

Case 31 — Georgia Food Processing Plant

Steam for Frozen Foods



One of the two 150 hp Cyclotherm units in the processing plant.

J. D. JEWELL, Inc., of Gainesville, Ga., one of the largest frozen chicken processors in the United States, has two 150 hp Cyclotherm steam generators in its processing department. About 20% of the capacity of these generators goes into steam for heating during the winter months. The bulk of the Cyclotherm output supplies hot water, used chiefly in getting the feathers off the chickens. The Jewell company processes 35,000 chickens per day.

The two 150 hp Cyclotherms are the only ones in the Jewell installation. In the cooking department there is a 100 hp unit and an 18 hp unit. This equipment supplies steam for the cooking of Jewell poultry and beef pies and for the part of the chicken production which is pre-cooked. Jewell also has an 80 hp steam generator in a feed plant. Here the Cyclotherm supplies power for forming feed into pellets.

Jewell got the 100 hp Cyclotherm in 1949 and the first 150 hp unit in 1954. The 18 hp boiler arrived in 1955, then came the feeding plant Cyclotherm and the second 150 hp Clyclotherm for the processing department.

The five-Cyclotherm units have made a remarkable record for low maintenance costs. Mr. Jesse Brown, Maintenance Superintendent, says that since the first Cyclotherm was installed, it has never been necessary to replace or even to roll a tube. The boilers operate with natural gas and no cleaning has been necessary on the firing side. Operation has been uninterrupted, the boilers having been opened only for inspection. And their operating efficiency has been consistently better than 80%.

Case 32 — North Carolina Mechanics Crack a Tough Nut

Big Wrench

SOME time ago it became necessary to remove the head from one of our high pressure feedwater heaters. The nuts are usually removed by using a large impact tool. On this particular heater, the impact tool was unable to loosen the nuts.

The men tried to move the nuts by using a Jumbo head and sliding bar, but the bar bent and the nuts did not move.

Rolla C. Nelson came up with this idea as shown in the sketch. The part "A" consisted of a 1⅝ inch pin, inserted into the 1½ inch square drive of the Jumbo head. A space was burned in the 1 inch flat bar to allow the 1⅝ inch pin and head to drop in place, and the pin was welded to 1 inch bar. The 3⅛ inch socket was attached to the 1½ inch square drive, and the assembly was placed on the nut.

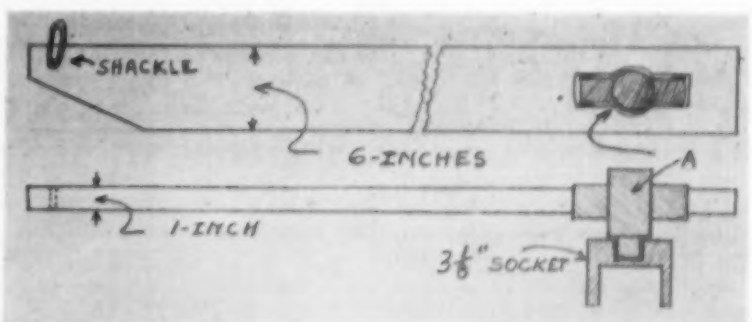
The hook on a chain hoist was fastened to the ⅝ inch shackle and the 1 inch bar put under a strain. Sledge hammer blows were applied to the 1 inch bar. The blows of the sledge hammer and the strain from the chain hoist soon caused the nuts to move.

After the nuts had been moved, it was an easy matter to complete their removal by using the impact tool.

The same arrangement was used to tighten the nuts when work was completed on the heater and we had no leaks when it was returned to service.

By G. G. AVANT
Wilmington, North Carolina

Sketch showing design of hoist operated wrench.



Case 33 – Missouri

De-Palletizer Speeds Handling

FASTER production, plus a decrease in beer case handling costs, ensued after Falstaff installed an Alvey automatic De-Palletizer machine at their St. Louis plant. At right, fork truck operator loads full pallets on infeed conveyor. Machine automatically unloads empty cases from pallets, unscrambles them and delivers them in a lengthwise position, in single file, onto conveyor system. At left, fork truck operator picks up load of empty pallets.

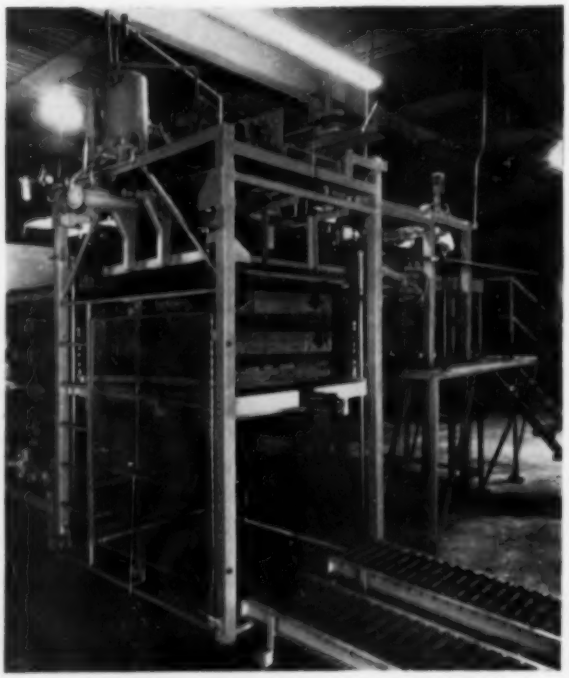
Case 34 – Georgia Manufacturer

Giant Palletizer Powered by Air

ONE MAN operating the completely hydro-pneumatic pallet loader can do the work of three men hand loading.

Southeastern Engineering & Manufacturing Co., Atlanta, Georgia, built the pallet loader pictured here for use on one of its customers packaging lines to load cartons on pallets. Time and space saving features of the palletizer met the requirements of this large manufacturer of packaged fragile goods.

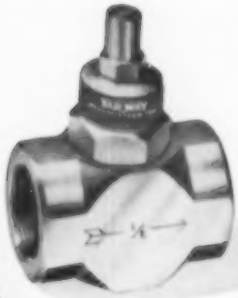
The air-powered units which operate the pallet loader are controlled by Bellows Electroaire Valves. The air motor is the original air cylinder with the built-in electrically controlled valve. It is this valve which permits all operating units of the palletizer to be electrically synchronized and interlocked through an electrical control unit. The valve operates on 8-12 volts; all control wiring is in this low voltage, thereby presenting no electrical hazard to either the operator or the machine.



½" No. 60 or 120

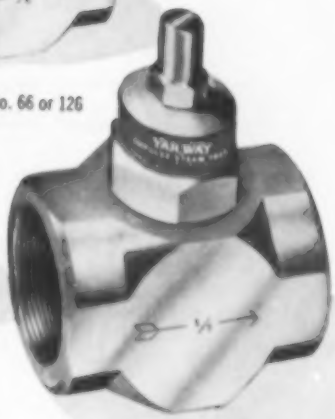
¾" No. 61 or 121

1" No. 63 or 123



1½" No. 66 or 126

1¼" No. 64 or 124



2" No. 67 or 127

all of these steam traps are impulse!

Take your choice! There is a Yarway Impulse Steam Trap for practically every trapping requirement in your plant.

Revolutionary when introduced 20 years ago, the *Yarway Impulse* principle has been proved by more than a million in service everywhere, is still gaining new friends every day.

SERIES 60—for *normal steam trap requirements;* pressures to 400 psi, temperatures to 450° F. Stainless steel body and working parts. Six sizes, ½" to 2".

NO. 20-A—available in ½" size only— similar to ½" #60, but with low capacity—designed especially for *light condensate loads.*

SERIES 120—same as Series 60 but for higher pressures and temperatures (600 psi, 750° F). Featuring all-stainless steel construction. Six sizes, ½" to 2".

SERIES 40—for *heavy condensate loads* requiring high capacity traps. Sizes ½" to ¾" in stock, larger sizes (1½", 2", 2½") available.

INTEGRAL STRAINER TRAPS—for marine use and for high pressure trapping service in steam power plants with pressures up to 2500 psi. Six sizes, ½" to 2"; flanged and socket-welding ends.

All Yarway Impulse Steam Traps are available through 270 convenient local Industrial Distributors. For descriptive bulletin on any type of Impulse Trap, write . . .

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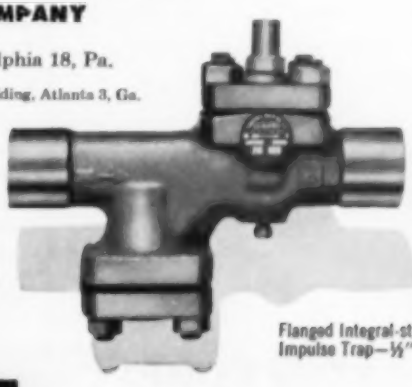
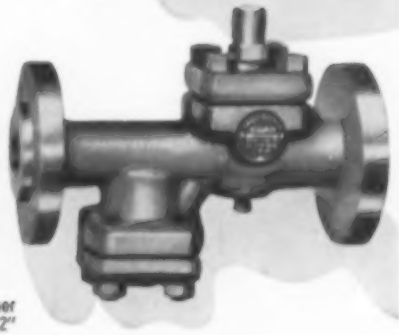


Socket-weld Integral-strainer Impulse Trap—½" to 2"



Flanged Integral-strainer Impulse Trap—½" to 2"

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The Impulse that revolutionized steam trapping 20 years ago

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MOTORPUMP quality

Here's the major point to keep in mind the next time you're ready to order centrifugal pumps . . . year after year the quality of I-R Motorpumps continues to pay off in actual savings through reduced maintenance costs, uninterrupted service and maximum pumping efficiency.

You can always choose the right pump from the wide range of Ingersoll-Rand Motorpump types and sizes, and be sure of modern design features that assure rugged dependability.

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Case 35 — North Carolina

Storage Increased 60% Neoprene Check Valves

LARGE scale consumers of soda ash solution can save valuable storage space by slurrying their soda ash with water rather than storing it the conventional way as the dry powder. This is because soda ash plus a limited amount of water forms a slurry of monohydrated crystals in a saturated solution.

In a properly designed system one cubic foot of slurry contains 59 lb of sodium carbonate, whereas there are only 34 lb in a cubic foot of the dry powder.

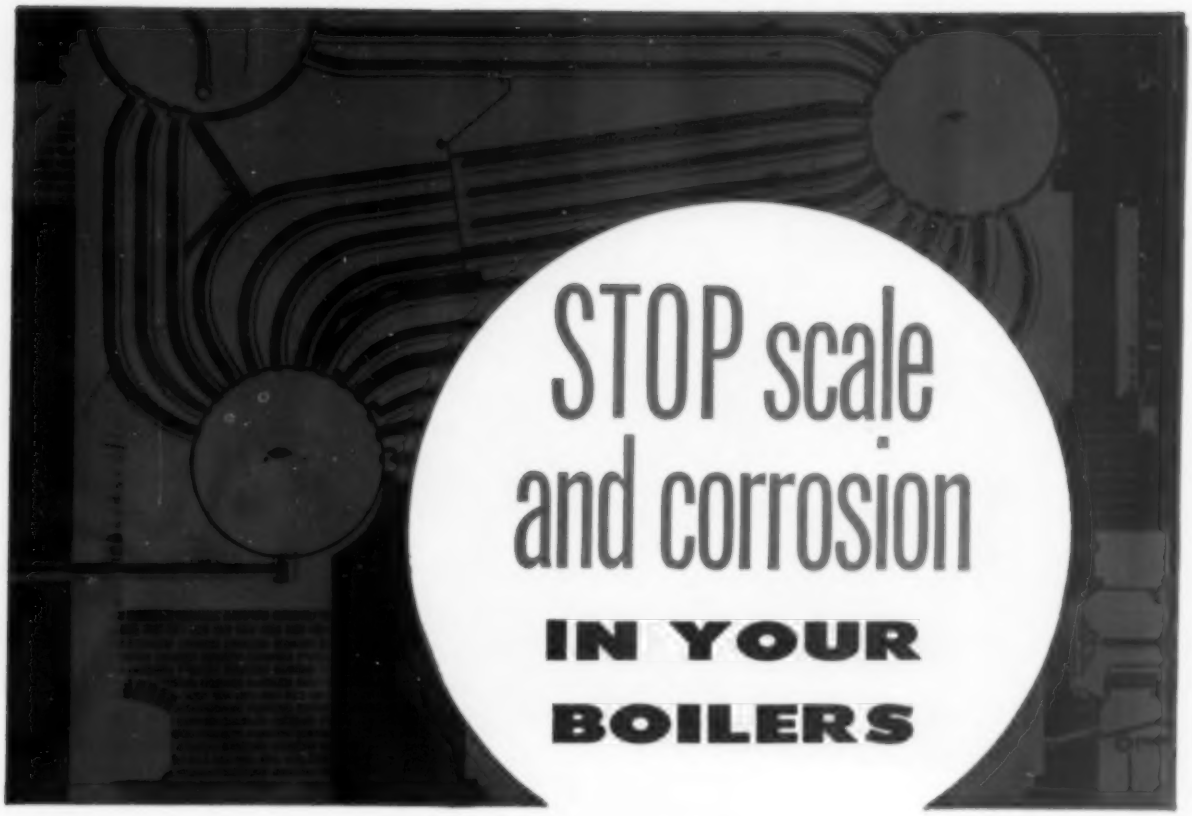
This density relationship is the basis for an economical bulk handling system recently developed by Diamond Alkali Company. An ingenious sleeve-type check valve made of neoprene plays an important role in the success of the system.

Lithium Corporation of America is operating a typical installation at their Bessemer, N. C. plant. Dry soda ash is sucked from freight cars into each of two 74,000 gallon capacity tanks through a slurrifier. The slurrifier (patent rights held by Diamond Alkali Company) is a specially designed three-concentric-pipe unit that mixes the soda ash and water in the proper proportions and at the proper rate.

The dense monohydrate slurry quickly settles to the bottom of the tank in a layer up to about fifteen feet deep, leaving a clear supernatant layer of saturated (30%) soda ash solution at least three feet deep. Solution is drawn off from the top layer to processing operations as required. The slurry layer contains the soda ash inventory in compact form, readily convertible to solution by the addition of more water.

To replenish the depleted solution layer and, incidentally, to keep the slurry layer fluid, water is introduced as required through 88 sparging nozzles. Each sparging nozzle is simply a short ½ in. pipe

(*Continued on Page* 93)



STOP scale and corrosion IN YOUR BOILERS

Every good engineer knows that the costly shut-downs and repairs caused by scale and corrosion can be avoided through the use of the right feed-water treatment. That's why hundreds of the best engineers use Braxon and Flako formulas.

These highly-developed products, based on phosphate or carbonate control, prevent and remove scale in boilers. They also prevent foaming and carryover.

There's an Anderson field representative in your area who has broad experience in every kind of industrial water problem. He will gladly analyze your water and prescribe the proper treatment to protect your equipment against costly corrosion and scale. What's more, he will continue to make periodic analyses to be sure you are being properly protected. The valuable service costs you nothing. It can save you much. Let us know when you would like to see him.

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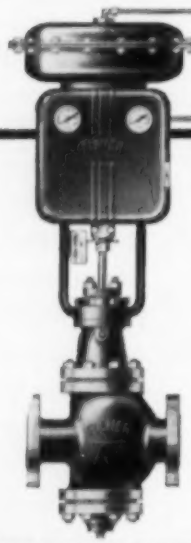
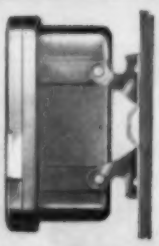


Any of the Wizard controllers can be yoke mounted on a diaphragm control valve to make a compact pilot operated pressure regulator as shown above. All Wizards are normally supplied with an operating medium air set which filters and reduces supply pressure of 25 to 250 psi to constant pressure of 20 psi for 3 to 15 psi, or 35 psi for 6 to 30 psi operation.

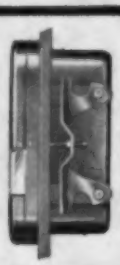
SURFACE MOUNTING

The Wizard can be mounted on the surface of a wall or any stable surface. A special mounting bracket is provided and any type of screw or bolt suitable for the mounting surface may be used.



FLUSH MOUNTING

By turning the bracket around that is provided for surface mounting, any Wizard can be mounted flush to a panel.



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WIZARD II
PRESSURE CONTROLLER

For over a quarter century, the name "Wizard" has become a byword as the pressure controller that is accurate, dependable and simple to operate in all types of industry.

Now, the WIZARD II takes over to meet the demands of modern, complex control systems requiring closer control. The WIZARD II retains all of the basic simplicity, accuracy and dependability of the Wizard 4100U, plus a number of new components. The WIZARD II is in a waterproof aluminum die-cast case and cover with ¼" tapped vent for gas service. With the addition of a few parts, the basic proportional controller can be converted to: (1) two-position action or "Snap Action", (2) pressure transmitter, (3) controller with remote set adjustment, (4) proportional plus reset response. The WIZARD II can be changed from direct to reverse action or vice versa without additional parts.

The superior subassembly construction stresses simplicity and compactness. Each subassembly is assembled and calibrated prior to mounting in the case. All Series 4150 Wizards can be supplied for remote set adjustment for changing the pressure setting from a location away from the Wizard controller.

Careful and exhaustive tests have conclusively proved that the WIZARD II measures up to the rigid Fisher standards.

A completely descriptive and illustrated bulletin on the WIZARD II is yours for the asking. Write today for Bulletin No. D-4150.

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FISHER® Controls
SINCE 1880

BEACON COAL

EASTERN GAS AND FUEL ASSOCIATES

PITTSBURGH • BOSTON • CLEVELAND • DETROIT • NEW YORK
NORFOLK • PHILADELPHIA • SYRACUSE

For New England: New England Coal & Coke Co., For Export: Castner, Curran & Bullitt, Inc.

nipple with four ¼ in. holes drilled around its circumference and the end closed. The nozzles are screwed into 1¼ in. feeder pipe, they point downward, and they are sheathed with tight neoprene sleeves.

These elastic sleeves permit fresh water to percolate up through the monohydrate slurry, extracting a saturated soda ash solution, but prevent solids back-flow from clogging the nozzle openings.

This operation exposes the neoprene sleeve valves to steam at about 265 F.

In use since January, 1955, Lithium Corporation's soda ash storage equipment has operated continuously with practically no maintenance required on the important submerged neoprene check valves.

Case 36 — Louisiana

Prevention of Caking

WE RECEIVE bulk lime in closed hopper type railroad cars and it is unloaded into cylindrical tanks which have a conical bottom and a control valve at the apex of the conical bottom.

Difficulty with packing and caking in the conical bottom was experienced. Trouble continued after all possible points of rain water leakage were sealed.

It was theorized the moisture in the air that came from outside the tank when lime was withdrawn was causing condensation that resulted in caking. Also, the "breathing" of the tank during temperature changes caused condensation.

We had available a dried air supply for control instruments. A ¼ inch tube was run from this dried air supply line to the top of the bulk lime storage tanks and a small "bleed" of dried air keeps a slight pressure on top of the lime in the tank. This prevents intake of moist air in the space on top of the lime in the tank and we have very seldom had any caking or packing in the cone since we started this practice.

By B. H. MYLIUS, Area Supt., Cit-Con Oil Corporation, Lake Charles, Louisiana.

ACCURATE,
CONTROLLED,
Timed
LUBRICATION
The New 83-V vacuum pumping unit "with dry sight feed," an exclusive Manzel development will end your liquid sight feed problems. Install them on any existing Manzel lubricator. Now — more accurate than ever . . . it will pay you to get complete detailed information on this dependable, field-proven Manzel unit.
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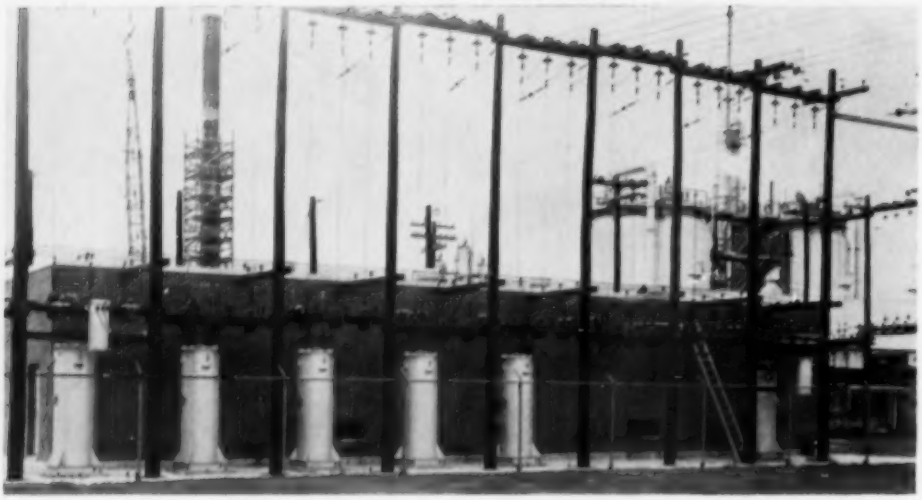
LUBRICATORS • CHEMICAL FEEDERS • SLURRY PUMPS
318 BABCOCK STREET • BUFFALO 10, NEW YORK
A Division of Houdaille Industries, Inc.



CURRENT - LIMITING REACTORS protect electrical equipment from possible fault currents at the Baytown, Texas, Refinery of the Humble Oil & Refinery Company.

Case 37 — Texas Refinery

Reactors Protect Refinery Equipment

CURRENT - LIMITING reactors help to provide continuity of service and short circuit protection for electrical equipment at the Humble Oil & Refining Company's Baytown Refinery here.

The recently installed General Electric reactors form a vital link between power the refinery generates and that which it buys from a utility.

The two electrical systems are tied together for better continuity of service, but the very strength of the tie makes possible fault currents on much of the electrical equipment that could exceed the maximum of 50,000 kva for which the equipment was designed.

The G-E current-limiting reactors were installed to keep maximum fault currents on all parts of the system below this permissible value.

The six reactors used are oil-immersed, with completely sealed tanks, each rated 7,200 kva, 2,400 volts. Tank-type reactors were chosen instead of the conventional dry-type because of the corrosive and humid atmosphere at the refinery.

Maintenance is a continuous problem in humid atmospheres, and the ease of repainting these reactors was an important consideration in their selection.

Case 38 — Georgia Paint Manufacturing Plant

Speed Control Aids Paint Production

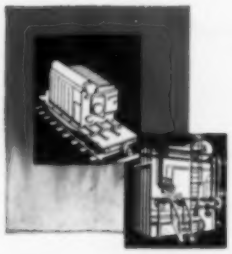
TO SEPARATE big pigment particles from the little ones, paint manufacturers use high speed centrifugal machines. Speed must be adjusted and closely controlled to provide required performance.

Until a few months ago, Thompson-Weinman Company, Cartersville, Georgia, varied speed of one 40 hp centrifugal by means of an adjustable pulley device. Some drift in speed made it hard to pinpoint and hold the speed they needed for accurate separation.

Ampli-Speed Driving Centrifugal Machine

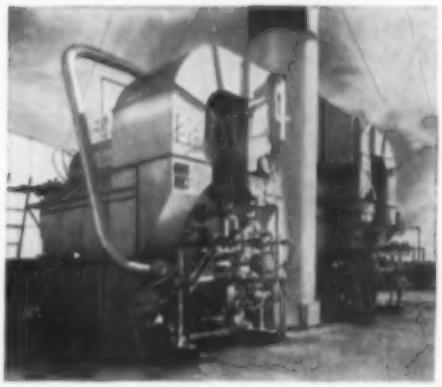
To correct this condition, Thompson-Weinman replaced the mechanical drive with an Ampli-Speed. The new Drive lets the operator pinpoint the exact speed he needs. Drift is minimized by feedback control. If load speed begins to vary during steady-state operation, output from the d-c tachometer generator changes. This change is fed to the magnetic amplifier control which increases or decreases Ampli-Speed excitation to stop the drift.

The drive motor, coupled to the Ampli-Speed, is a 40 hp, 1780 rpm squirrel cage unit. Output of the Ampli-Speed is belted to the constant torque load with a 3:1 pulley ratio. Load speed ranges from 640 to 190 rpm.



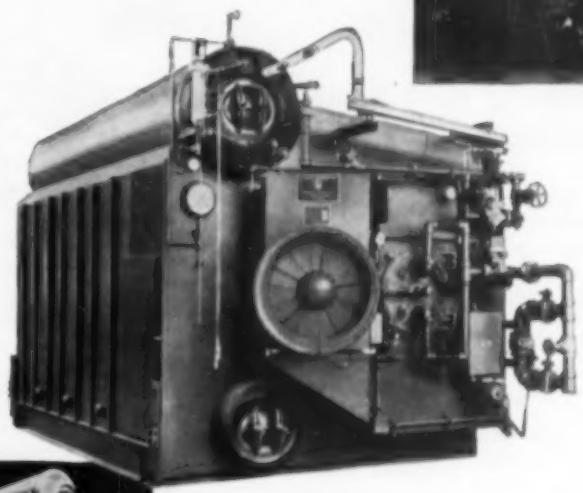
HEAT ENGINEERING by FW

extends Central Station Reliability to Standard INDUSTRIAL and PACKAGED UNITS



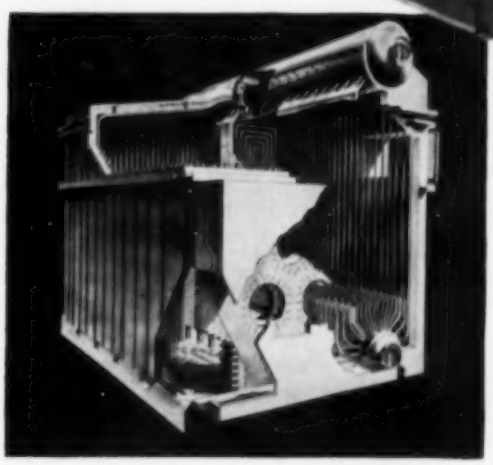
PACKAGED STEAM GENERATORS of the water-tube type were introduced by Foster Wheeler in 1940 — combining in a single, compact, shop-assembled unit, all the necessary facilities for the dependable and economical generation of industrial steam. Continual research and development have resulted in further improvements in design and construction, and today the FW line of Packaged Steam Generators, in capacities from 10,000 to 60,000 lb/hr, represents the last word in modern steam plant design, reflecting over half a century of service to the power generation industry. Features include 36″ steam drum and 24″ water drum, staggered boiler tubes, closely spaced waterwall tubes, water-cooled target wall, and wide choice of burners and controls.

Above: Two FW packaged boilers — the first ever offered to industry — were installed for oil field drilling operations in 1940. They are still in service, delivering low-cost steam.



Left: New Foster Wheeler series AG-100 Packaged Steam Generator.

Cutaway view of typical FW Standard Steam Generator.



STANDARD PRE-ENGINEERED UNITS by Foster Wheeler offer all the advantages and economies of *standardization* for larger industrial steam generators of from 50,000 lb/hr to 450,000 lb/hr capacity. The new FW line of "SC" and "SD" standard units is heat engineered to the same standards of dependability and performance which have made Foster Wheeler steam generators first choice in many of the leading central station plants throughout the country. Features include completely water cooled walls, efficient firing arrangement, fully drainable superheater, high steam purity, unrestricted circulation, pressure-tight construction and minimum refractory baffling. For further details, send for Bulletin B-55-4.

FOSTER FW WHEELER

NEW YORK • LONDON • PARIS • ST. CATHARINES, ONT.

Before you buy any boiler

compare quoted prices with REAL COSTS

New Cleaver-Brooks cost analyzer clears "quotation" confusion — reveals ALL costs

Get *all* the costs . . . the *real* costs . . . down on paper before you recommend or specify a boiler to your clients. On many boiler installations "quoted prices" seldom agree with the total costs, as you may have learned. This is frequently the case with so-called "built-up" boilers assembled on the site.

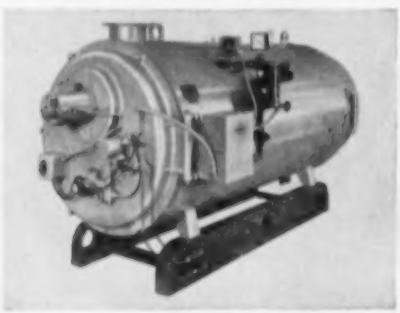
Cleaver-Brooks' cost analysis enables you to compare all material costs (boiler, steam trim, burner, refractory, controls and other equipment) and installation labor costs. You'll know the "real costs" on the complete installation before you start.

Real eye-opener

The figures you'll see may be startling. In most cases the cost analysis proves a Cleaver-Brooks costs *less*. On-job time is drastically reduced because Cleaver-Brooks packaged units are fully assembled, ready to install. Cleaver-Brooks boilers give you more in performance, too . . . each boiler is fully fire-tested at the factory under load, tuned to peak economy. Starting service and on-the-job operator training by authorized field engineers further decreases your over-all costs.

Contact your Cleaver-Brooks agent

Once you add up all the benefits of a Cleaver-Brooks "one-cost" package . . . the proved trouble-free economy of exclusive four-pass, forced-draft design, you'll find it pays over and over to analyze costs carefully before you buy. See your Cleaver-Brooks agent for details or write Cleaver-Brooks Company, 305 East Keefe Avenue, Milwaukee 12, Wisconsin, Dept. L.



Choose from 19 sizes, 130 models, 15 to 600 hp. Oil, gas and combination oil/gas fired — steam or hot water for heating or processing.

Cleaver Brooks

ORIGINATORS OF SELF-CONTAINED BOILERS

Case 39 — New Mexico

Correct "C" Clamp?

JAKE O'ROUKE was ambitious to become a machinist so he quit selling shoes and snagged a job as a helper in a machine shop.

This was a new experience for Jake but he got along, and within a week he was doing little odd jobs of drilling and grinding. A little later Jake was helping to install a new motor and the repair machinist told him to take the brass number plate to the shop and drill a couple of holes in it so it could be fastened to the motor frame.

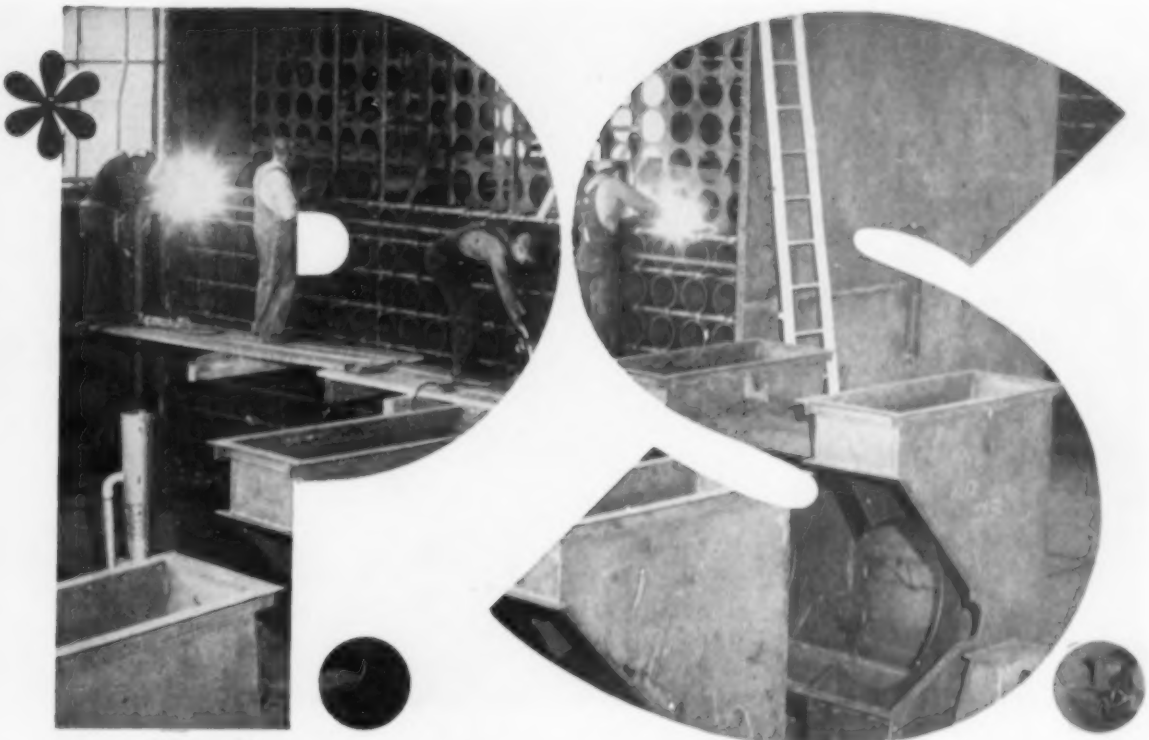
Jake hurried to the light drill press and stood waiting while Tom Anders, the head mechanic, was drilling a precise little item. Jake was impatient and when Tom went to the tool room for a reamer Jake stepped up to the drill press, put a ¼" drill in the chuck and started drilling through the brass plate. The drill suddenly "grabbed" and spun the plate, whacking Jake on his fingers.

Jake was sore but wiser so he picked up a clamp that Tom had left on the table and clamped the brass plate good and tight, then proceeded to drill the holes in safety.

Jake was just finishing the second hole when a powerful hand grabbed his shoulder, yanked him from the drill press and spun him across the floor. Then as a follow-through Tom Anders proceeded to say sizzling things about how dumb some guys can be. Jake, amazed at the violence and the gush of prize "cuss" words, could not imagine what was wrong. Finally it dawned on Jake that somehow Tom didn't like the idea of Jake using the "C" clamp, so he tried to pacify him. "No harm done, Mr. Anders," said Jake, "that's what 'C' clamps are made for."

Anders exploded, "That's no 'C' clamp you ? ! * # idiot — that's my ten thousandth inch micrometer."

By George Pearce, N. M.



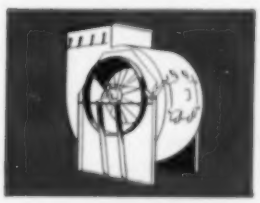
*PROBLEM SOLVERS

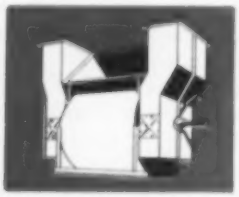
FLY ASH ARRESTOR'S research laboratory, engineering and manufacturing facilities are *totally set up* and especially experienced to provide a "dollar-saving" solution to the most perplexing dust collecting problem. Tell us about your conditions . . . what you want done!

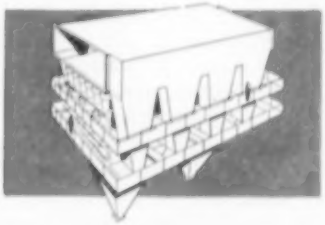
WHIRLEX *dust collecting efficiency begins with "tailored" planning.* Each dust collecting problem . . . whether nuisance elimination or process material recovery . . . gets special study and handling. FLY ASH ARRESTOR engineering solves each problem with a completely integrated, *shop-assembled* WHIRLEX Dust Collector Unit specifically designed and constructed for the job.

WHIRLEX *heavy-duty* industrial exhaust fans are available to handle any air moving problem. WHIRLEX *standard* forced and induced draft fans are available for boiler applications.

WHIRLEX equipment assures maximum efficiency right from the start . . . and continues to pay off with consistently low operating and maintenance costs.







- CTF Mechanical Gas Centrifuge Collectors • MTSA 9CYT Multiple Cyclone Collectors
- Induced Draft Fans • Forced Draft Fans • Special Duct Work
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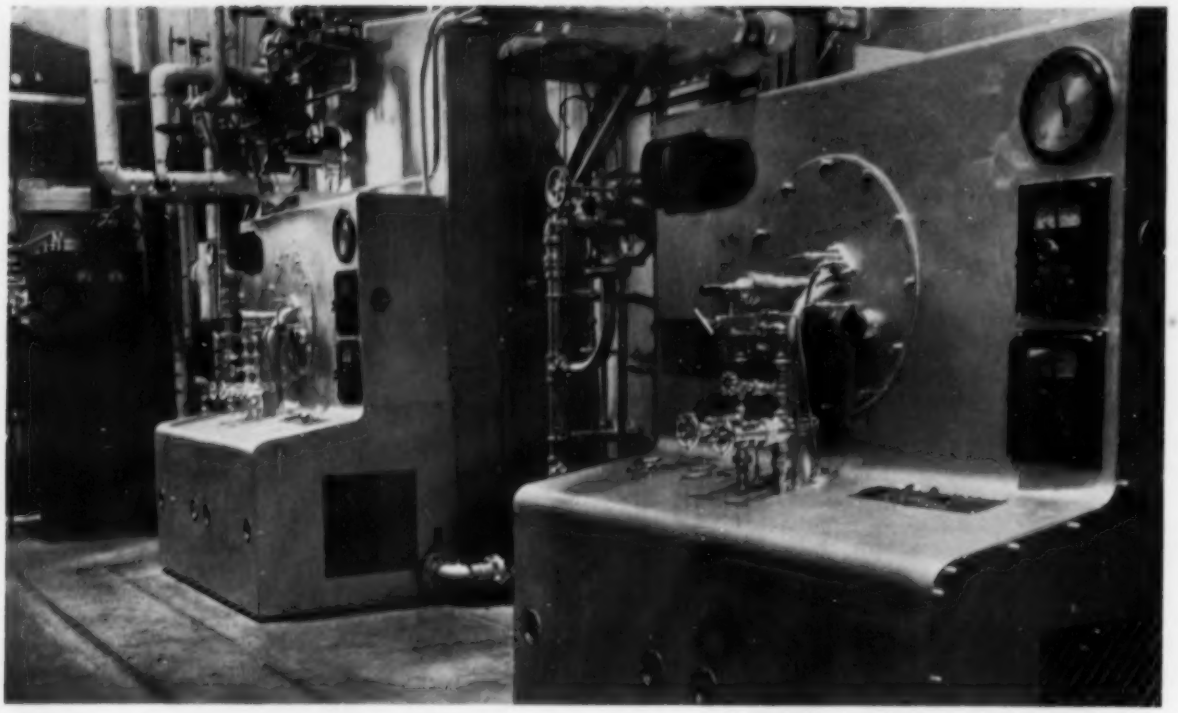


Firing consoles of two C-E Package boilers installed at Milledgeville Plant of J. P. Stevens & Co., Inc.

Case 40 — Georgia Textile Mill

Three Times as Much Steam in Same Building Space

By W. F. HUMBERT, Engineering Dept., Southern Group, Wool and Worsted Division, J. P. Stevens & Co., Inc.

THE MILLEDGEVILLE Plant of J. P. Stevens & Co., Inc. specializes in the manufacturing of worsted cloth. It was recently decided to carry out dyeing and finishing at this plant instead of depending upon the facilities of the nearby J. P. Stevens plant at Dublin, Georgia.

The existing boiler room at Milledgeville consisted of three stoker-fired boilers, originally installed in 1942, with a total capacity of 36,000 lb. By careful selection of equipment it was found possible to install two new Combustion Engineering Type VP shop-assembled boilers in the same space as previously occupied by two of the 12,000-lb-per-hr boilers. The new units, which are designed to burn natural gas or No. 6 fuel oil, each have a capacity of 36,000 lb of steam per hour, or three times as much as the original units.

In order to install the new equipment it was necessary to remove the front wall of the boiler room and lower the Package Type boiler inch by inch to the boiler room floor some 10 or 12 feet below. One of the three original boilers remains in the boiler room but may be removed at a later date if and when steam load increases. Should this occur a third Package Water Tube boiler would be installed of the same size as the two new ones.

Robert and Company Associates of Atlanta, Georgia were the designers and engineers for the new dyeing and finishing department which went into operation during the summer of 1957.

Case 41 — Louisiana Oil Co.

Plugged Lines Avoided

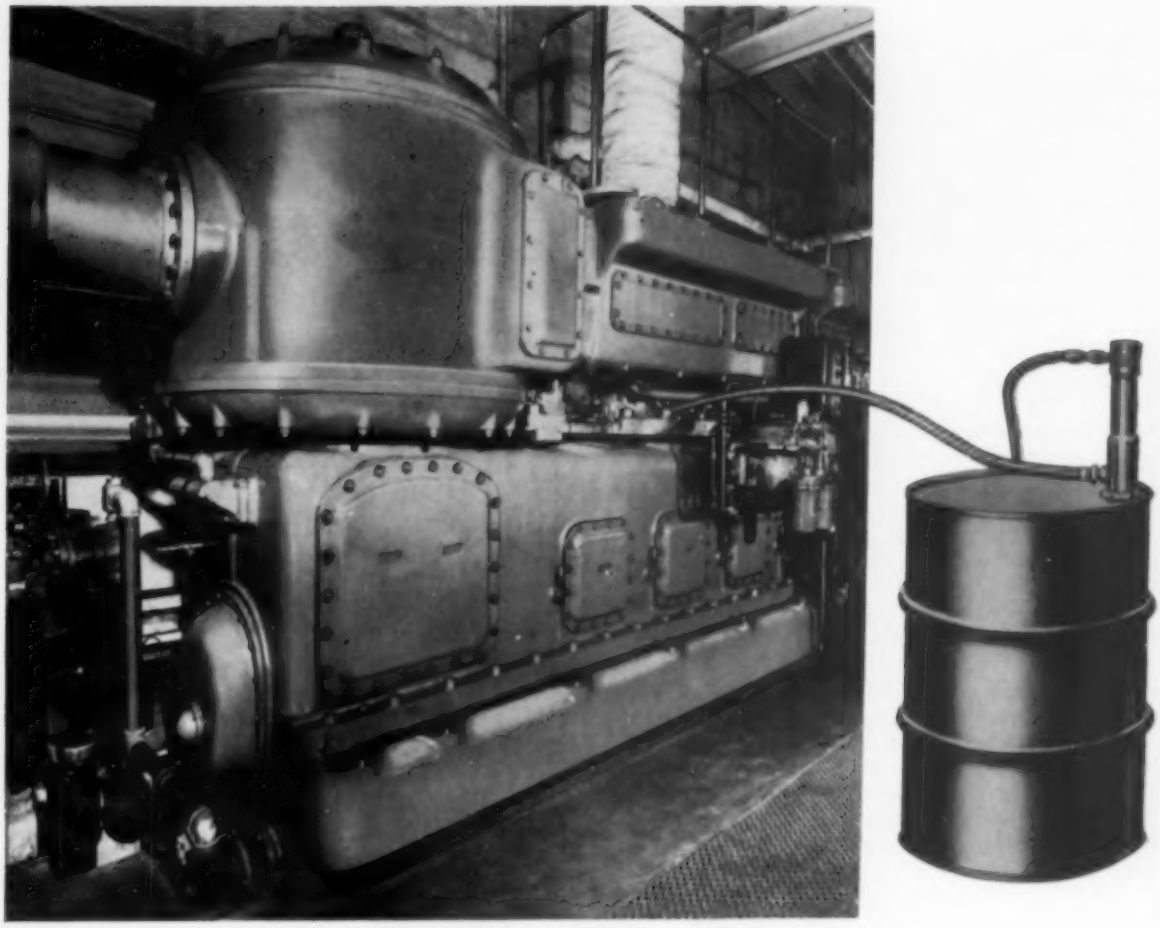
ADDITION of lime slurry in treating boiler feed water often results in plugged slurry feed lines and duplicate systems are usually provided so that operations may continue while one system is being cleaned. Acidizing is often used as the cleaning method although many still depend upon mechanical means for cleaning.

We have devised a method of operation which has kept our lime slurry feed lines clean over a period of eight years of operation.

We use returned condensate for mixing our lime slurry in alternate feed tanks. We keep a small stream of condensate pumping through the lime slurry feed lines not in use. The velocity of the liquid condensate in the pipe and the solvent action on any lime deposited from previous cycle of use has kept the lime slurry feed lines clean.

By B. H. MYLIUS, Area Supt., Cit-Con Oil Corporation, Lake Charles, Louisiana.

Varnish Problem Vanishes!



Stop the formation of harmful **varnish,** sludge and carbon in your Diesels and *keep it stopped* with Sinclair RUBILENE® or RUBILENE HD, the high viscosity index oils proved by over 35 years in industrial Diesel applications. RUBILENE earns its reputation by its performance under continuous operation and heavy loads. It fights deposits and gives better protection to cylinders, pistons, rings and other vital moving parts. Your Diesel stays on the job longer . . . service time is cut 'way 'way down.

Let RUBILENE help solve *your* lubrication problems. Regardless of the make of your Diesel, there's a member of Sinclair's RUBILENE or RUBILENE HD family that meets your requirements. Call your local Sinclair Representative for further information, or write for free literature to: Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation!*

Dino, the Sinclair Dinosaur, says:

"Send now for free literature on RUBILENE!"

SINCLAIR RUBILENE® OILS

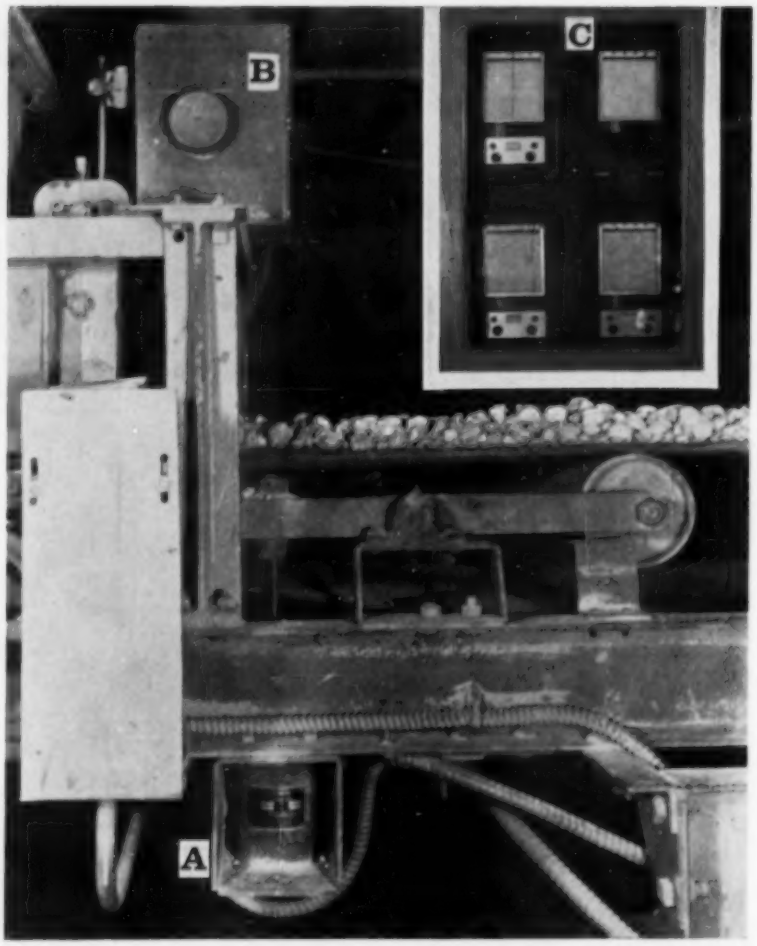
Case 42 — Tennessee

Automatic Feed Increases Grinding

A TENNESSEE producer of cement has automated a weighing process and increased production at that stage by 10%, with some improvement also in product quality.

Savings are made at points where semi-finished product is fed from hoppers onto belts which in turn feed finish-grinding machinery. When the weight of material on a belt is held at maximum, production of that grinder is also maximum and there is also some improvement in evenness of grind. The automatic control was orginally used experimentally on only one grinding line but is now used on all.

The control is effected at the power-actuated gate of the feed hopper, where an L&N electric drive unit throttles the opening as directed by a Speedomax electronic recorder-controller. The instrument gets its original information about the actual weight of material on the belt, from an electronic load cell attached to the belt. This general type of control is used in many industrial processes, though the details of equipment vary widely.



Showing arrangement of linkage. The Load Cell (A) sends signals to L & N Speedomax H with Series 60 Position (C) — Adjusting Type (PTA) control system, which in turn positions bin gate through an L & N Drive Mechanism (B) to maintain pre-set pounds per belt foot.

Case 43 — Georgia Textile Mill

Electrical Cable for Severe Service

A PAPER MILL in Florida and a North Georgia textile mill had similar demanding needs for plant (electrical) power and control wiring systems. Ambient conditions at both mills were extremely severe; a very hot and super-saturated, even corrosive atmosphere was not uncommon. Space was limited. Plant downtime caused by cable failure due to these conditions would be extremely expensive. A wiring system that would meet these conditions was mandatory.

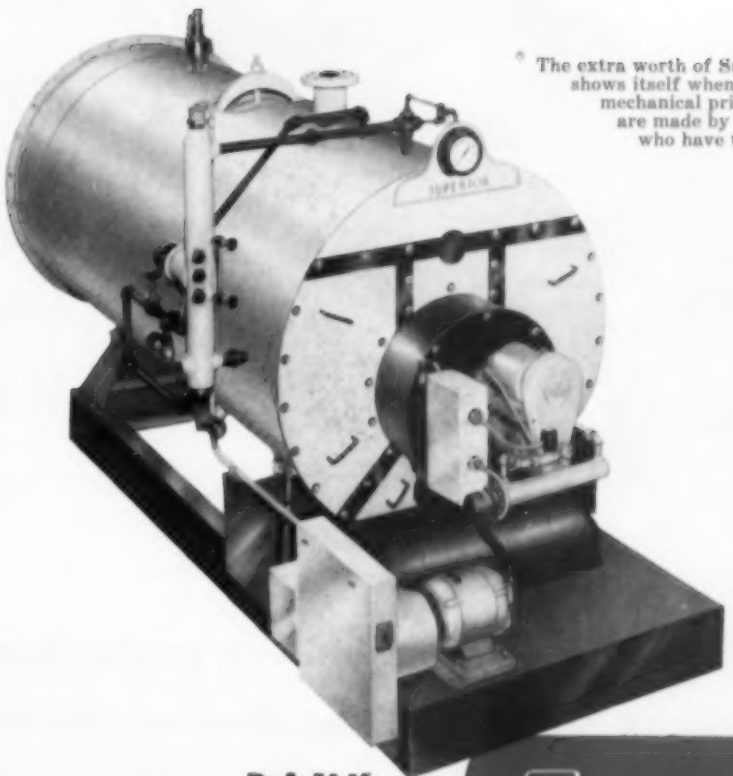
General Cable Corporation's Mineral Insulated Cable (Designed Type MI per Art. 330, N.E.C.) was deemed the wiring system which would fill these needs most satisfactorily. MI is cable in which one or more electrical conductors are insulated with a refractory mineral and enclosed in a liquid tight and gas-tight copper tube sheathing.

It is fabricated from inorganic materials; consequently no component of it is subject to aging, decay, rot or burning. It is watertight; the cable may be submerged or run through areas of great temperature variation with no resultant "dew point" failure. The copper sheath provides a surface that is resistant to general corrosion. Cable diameter is approximately half that of other systems, while the current carrying capacity is greater than most. These points add up to a system free from maintenance and cost problems.

The soundness of the decision to utilize MI is becoming more apparent each day. Downtime is at a minimum. As other circuits fail, MI is the logical replacement. The installations at these two plants have taken full advantage of the unique inherent features of MI with the result that their problems have been met successfully.

the man to ask

is your ENGINEER*



* The extra worth of **Superior Steam Generators** shows itself when evaluation of equipment, mechanical principles, and heat transfer are made by Consulting Engineers . . . who have the knowledge and ability to make such evaluation.

for performance you can **BANK** *on*

SUPERIOR COMBUSTION INDUSTRIES INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

SUPERIOR
STEAM GENERATORS

Wrought Iron Pipe's built-in protection ...always "on guard" against corrosion

Wrought iron pipe's "armed guard" against corrosion is a concentration of thousands of glass-like iron silicate fibers distributed throughout the metal.

These iron silicate fibers are relatively immune to corrosion . . . so any attacks by corrosion are evenly dispersed over the entire surface of the metal. As a result of this built-in protection, deep pitting and penetration are repelled . . . costly premature repairs and maintenance are eliminated.

Our booklet, "The ABC's of Wrought Iron" tells more of this story. You'll find it profitable reading. Write for your copy today.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Division Offices in Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. International Division: New York, N. Y.

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BYERS Wrought Iron Tubular and Hot Rolled Products

ALSO ELECTRIC FURNACE QUALITY STEEL PRODUCTS

Here's all it takes

TO CONVERT THIS NEW WESTINGHOUSE COMBINATION LINESTARTER FROM NON-FUSED TO FUSED!

or change fuse clip ratings from 30 to 400 amp

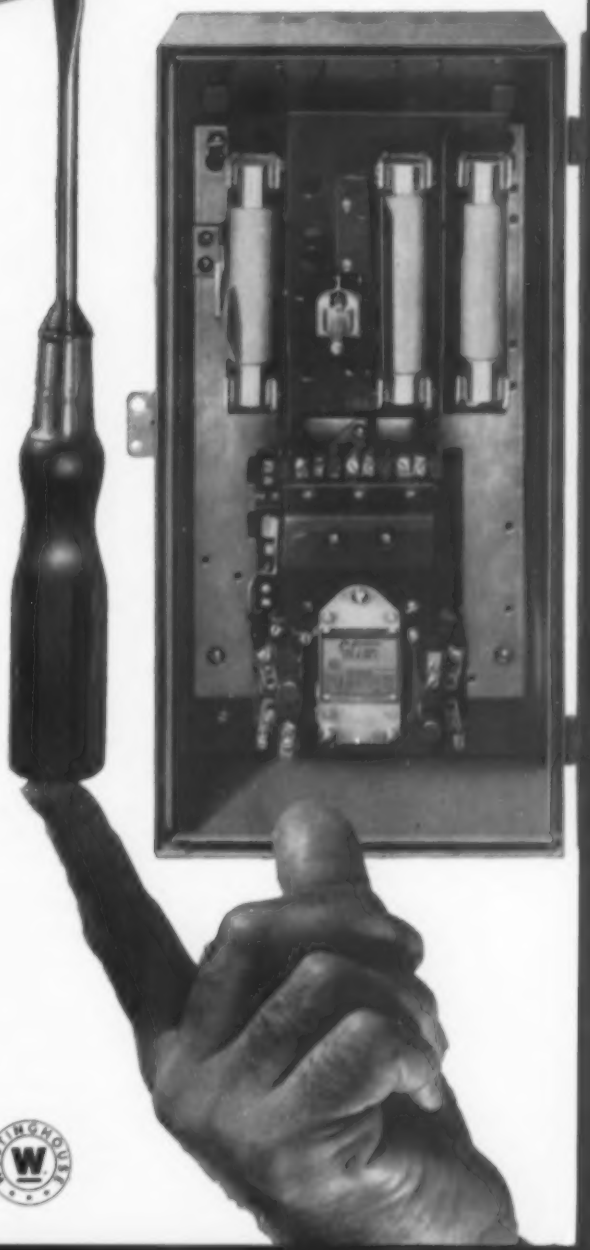
This is flexibility!

This is the new Westinghouse combination Life-Linestarter® with the Visi-Flex switch! . . . the convertible switch that enables you to modify the new Westinghouse combination linestarters (in sizes 0 through 4) to meet both your present and future power requirements by simply adding or changing a set of fuse clips.

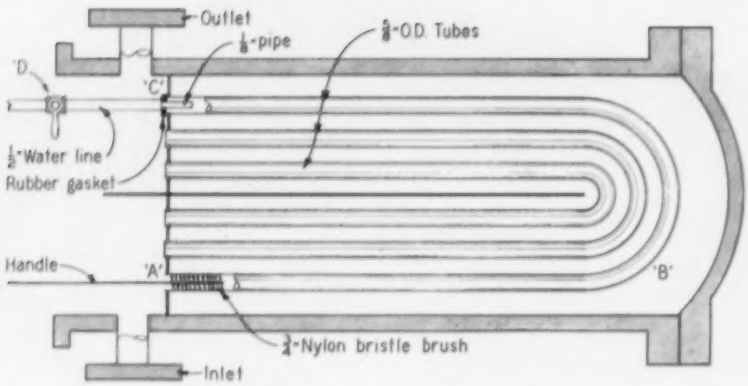
All it takes is a screwdriver, a Westinghouse Fuse Clip Kit, and about five minutes of your electrician's time to change from non-fused operation to fusible, or to vary fuse ratings from 30 through 200 amps 600 volts, and 400 amps 250 volts, over a range of four switch sizes.

What's more, the new Westinghouse Life-Linestarters with Visi-Flex switch are up to 25% smaller than the old design—good news for plant engineers with a space problem.

For plants which face adverse operating conditions involving lint, dust, or oil seepage, the new linestarters are available in the NEMA-12 dust-tight enclosure, as well as the standard NEMA-1 shown at right. And—they're available *now*, from local warehouse stocks. Simply call your nearby Westinghouse sales office or distributor. J 30284



YOU CAN BE SURE...IF IT'S Westinghouse



Case 44 — North Carolina

Brush Cleaning Tubes

TUBES in one of our high pressure feedwater heaters are approximately 21 ft long, ⅝ in. OD. There are 418 tubes in the top half and the same number in the bottom half.

Our maintenance problem was to remove iron oxide with a ⅝ in. nylon brush. Our planned method was to run the brush thru the lower tubes and then put water in the upper tubes and wash out the deposit at point B (see sketch). We would then reverse the operation for the upper tubes.

We soon ran into rough going. Because of dampness in the tubes, the nylon bristles soon became clogged with oxide. We broke off two brushes inside the tubes and cleaned out only 50 tubes in eight hours.

We then tried wetting the tubes with a water hose and soon were able to speed up the job. We then made up a fitting consisting of a water hose and a ⅛ in. quarter turn cock, a piece of ⅛ in. pipe (equipped on one end with a coupling), a bushing ⅛ x ⅛ in., and a short piece of ⅛ in. pipe. We put a rubber gasket at the end of the bushing to act as a seal between the pipe and end of the tube.

The water line was inserted into the upper section of tubes at point C. When water started to come out of the tube at A, we inserted the nylon brush. The water flowing down thru the tube washed the iron oxide past the brush and out at point A. The brush was slowly pushed thru the tube as far as it would go, then slowly pulled out. Water was allowed to flow thru the tube after the brush was removed, until the water came clear. Pipe was then pulled out and inserted in another tube and water again turned on.

When the lower tubes were cleaned, we repeated the cycle on the upper section. The entire job was completed in 12 hours.

By GRADY BARNES, Wilmington, N. C.

Case 45 — Florida Utility

New Reeving System Triples Rope Life

THE NEW coal unloading tower at Tampa Electric Company, Tampa, Florida, incorporates a rope reeving system that promises to increase production by drastically reducing the number and extent of shutdowns required to replace wire rope used for hoisting and closing of the 6½-ton bucket.

The new reeving system, called the Progressive Reeving System utilizes a single continuous rope for both hoisting and closing.

This system was developed by the Mead-Morrison Division of McKiernan-Terry Corp., who supplied and erected this tower, the largest on the Florida coast, for the Nashville Coal Inc. of Madisonville, Ky. The tower has an unloading capacity of 700 tons per hour from ocean-going barges.

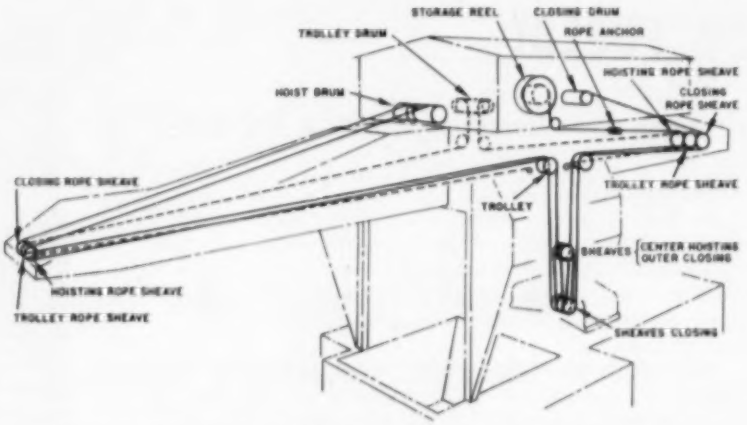


Diagram of Tampa Electric Company's coal unloading tower shows new reeving system.

The Progressive Reeving System is reported in actual field service to prolong rope life to more than three times that of existing systems. In addition, fewer men and less time are required for rope replacement.

In any rope system maximum wear occurs at points of contact with sheaves, rollers, and drums. When rope wears at such points in older systems, the entire rope must be discarded. With the new system, new rope from a storage reel is fed into the system in small increments and equivalent

Pinehurst tees off on fuel costs

Golfing resort cuts costs 33% with modern burning of coal

When the famous golfing resort of Pinehurst, N.C., decided to modernize its power facilities, the consulting firm of Wiley and Wilson, Richmond, Va., was called in.

Since coal cost about 40% less than the nearest competitive fuel, the final decision called for burning coal in modern equipment. Today boilers and combustion controls are automatic; coal and ash handling is greatly simplified. And now, according to management, "The cost of generating steam is 33.4% less than with the old plant."

Consult an engineering firm

If you are remodeling or building new heating or power facilities, it will pay you to consult a qualified engineering firm. Such concerns—familiar with the latest in fuel costs and equipment—can effect great savings for you in efficiency and fuel economy over the years.

Facts you should know about coal

Not only is bituminous coal the lowest-cost fuel in most industrial areas, but up-to-date coal burning equipment can give you 10% to 40% more steam per dollar. Today's automatic equipment can pare labor costs and eliminate smoke problems. And vast coal reserves plus mechanized production methods mean a constantly plentiful supply of coal at a stable price.

For additional case histories on burning coal the modern way or for technical advisory service, write to the address below.

BITUMINOUS COAL INSTITUTE • Southern Building, Washington 5, D. C.

worn lengths removed. Wear is thus spread evenly throughout the entire rope length.

Field experience has shown that this new system gives a rope life of 214 tons of material handled per foot of rope in the system. Conventional systems, employing the identical wire rope, gave only 64 tons per foot of similar service. Rope life was thus extended more than threefold.

The rope reeving installed on the Tampa Electric tower is shown in the accompanying diagram. The only equipment variations from systems on conventional towers are the addition of the storage reel for feeding rope into the system, and redesign of the hoist drum to include a reeving sheave. The new system retains all the normal independent hoisting, closing, and trolley motions of the grab bucket.

Tampa Electric's tower operators will find that feeding new rope into the Mead-Morrison Progressive Reeving System is extremely simple. Only two men are required for this operation, in contrast to the six men normally required to replace rope in existing systems. In addition, shutdown time is lessened, for one continuous length is used for both hoisting and closing.

Case 47 — Georgia

More Oven Efficiency With Air Flow Changes

THE Lanly Company has installed a longitudinal air flow system on an aluminum aging oven at Dixie Aluminum Corporation, Rome, Georgia, that has greatly increased the capacity and efficiency of this oven. A typical heating cycle is as follows:

1. Racks of aluminum extrusions and tubing are loaded in the oven.
2. The gas fired convection heating system located on top of the oven is placed in operation.
3. Large volumes of air are directed downward from the heating unit, then the air is passed longitudinally through the oven to the opposite end of the oven where the air is returned to the air reheating system. Approximately 90% of the air is recirculated thus giving a very high operating efficiency.
4. The aluminum extrusion or tubing is brought to temperature very uniformly and rapidly, held at temperature for the necessary aging or annealing time, then taken from the oven to be air cooled.

The principal advantages of a longitudinal air system on this or other types of industrial oven installations is that it greatly shortens time required to bring a product to temperature, thus allowing use of smaller ovens with less floor space occupied, and allows use of smaller circulating fans with a resultant saving in electrical and fuel consumption.

Data courtesy: PAUL E. CRAFTON, F. J. Evans Engineering Company, Atlanta, Georgia.

Case 46 — Oklahoma Metalworking

Motor Burnouts Eliminated on Welders

SEVERAL years ago we were having trouble with single phasing and subsequent burnout of our 3-phase welders. Motor repairs and replacements, plus the downtime was very costly. We decided to correct this situation and ran our own test to see if it could be done by individually protecting each welder with Fusetron (Bussmann Mfg. Co.) fuses.

On 400 amp welders, 3 pole fuse blocks were mounted in a steel enclosure. 80 ampere, 250 volt Fusetron fuses were installed on the load side of the enclosure. The circuits were then single phased. On every test the Fusetron fuses opened in 21 to 23 seconds. On checking further with a hook-on ammeter, we found the locked rotor current to be 325 amps.

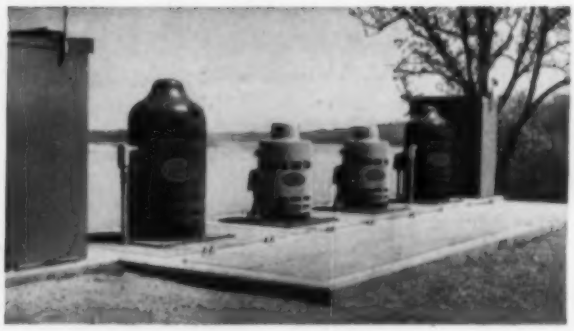
As a result of these tests, we protected all 62 welding machines with Fusetron fuses in the proper motor protection sizes. Yes, we have blown a number of fuses, but have not had one motor burnout due to single phasing. The Bussmann Fusetron fuses have cut costs for us. Today, we have 147 welding machines in operation and each one is protected.

By RALPH McCOLM, Chief Electrician, Black Sivalls and Bryson, Inc., Oklahoma City, Okla. In the photo Mr. McColm is shown (left) with T. J. JOHNSON, JR., Plant Engineer.

BIG CITY • BIG DEMAND

BIG RIVER Solution: Big Pumps

Capacity 50,000,000 gallons a day



BIG VERTICALS—The middle 2 of these 36" single-stage Peerless vertical intake pumps are driven by 150 hp induction motors. The other 2 pumps (same specifications) are driven by wound rotor motors.

BIG HORIZONTALS—These 8 Peerless horizontal single-stage, double-suction pumps are driven by 500 hp motors. Mounted in series, these 22", high service pumps maintain pressure at required standard.

Installed for ST. LOUIS COUNTY WATER COMPANY, NORTH END PLANT, ST. LOUIS, MISSOURI

Intake Pumps: 4 - 150 hp Peerless 36" single-stage vertical turbine pumps.

Booster Pumps: 8 - 500 hp Peerless 22" single-stage horizontal double-suction pumps.

Here's another installation that convincingly demonstrates Peerless' ability to do the complete pumping job efficiently:

vertical pumps for **water supply**
horizontal pumps for **water pressure**

Either way you look at a pumping job—towards horizontals or towards verticals—follow the lead of consulting and water works engineers everywhere. Select Peerless horizontal and vertical pumps from one of the most complete lines of high quality, water handling pumps offered by any manufacturer.

Remember: Peerless builds dependable pumps for *all* water handling services—supplying, circulating, dewatering, drainage and flood control protection—and for all applications—municipal, industrial, commercial and domestic.

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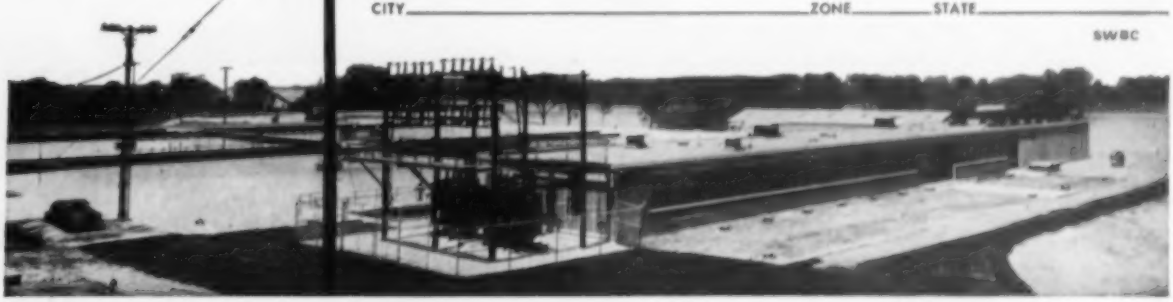
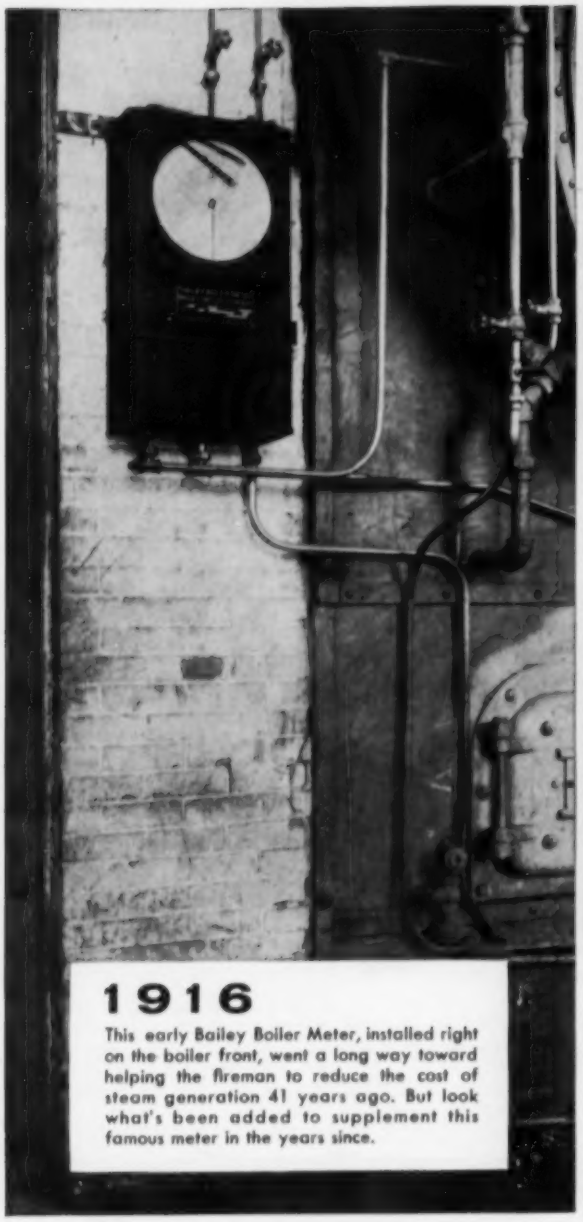
SWBC

BIG PLANT—View of the North End Plant, St. Louis County Water Company. A model of planning and efficiency, this is one of the nation's "show place" filtration stations.



Bailey's pattern for 41 more



1916

This early Bailey Boiler Meter, installed right on the boiler front, went a long way toward helping the fireman to reduce the cost of steam generation 41 years ago. But look what's been added to supplement this famous meter in the years since.

TODAY

Bailey leads the way in compatible pneumatic and electric measuring, transmitting, recording and control equipment. Thousands of successful installations are living proof of Bailey progress . . . in control engineering . . . in modern application technique.

BAILEY METERS

years of control progress

TOMORROW

New and even more amazing measuring and control techniques, such as Bailey's Performance Monitoring and Scanning Equipment, will be used. The Bailey pattern for progress is your assurance of the finest in instruments and controls . . . now and in the future.

AI34-2

Instruments and controls for power and process

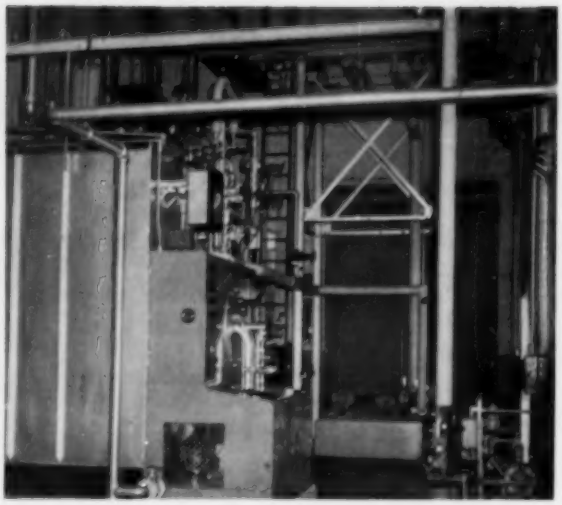
BAILEY METER COMPANY

1028 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada—Bailey Meter Company Limited, Montreal

Case 48 — North Carolina Mill

More Dependable Steam Supply from Shop-Assembled Boilers



ERLANGER MILLS, at Lexington, North Carolina, recently installed a 21,000 lb/hr shop-assembled Combustion Engineering Type VP boiler. The electrical full metering automatic combustion controls are console mounted. An alarm system is inter-connected between the boiler room and the office of Mr. Newsome, Plant Engineer.

The natural gas base fuel is burned approximately nine and one-half (9½) to ten (10) months per year while No. 6 fuel oil serves the balance of the year as well as stand-by at all times.

The new boiler replaced three (3) 225 hp vertical, coal burning, hand-fired fire tube boilers affording a remarkable change in boiler room appearance. Automatic water softening and chemical feed equipment was installed. The continuous blowdown system controls the boiler water solids concentration and the blowdown heat is recovered by a heat exchanger between the cold water supply and the new deaerating feedwater heater.

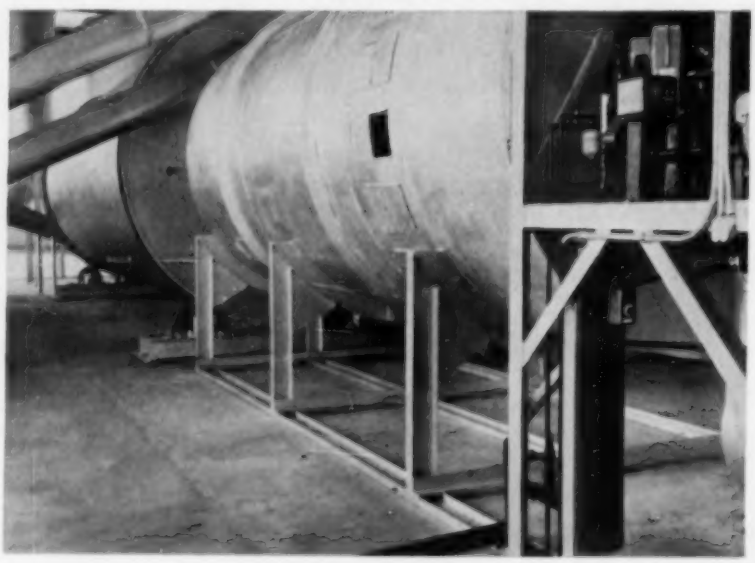
The new boiler operates over a load range of ten to one. Results to date indicate increased steam volume, quality, and dependability at a considerable decrease in operating cost.

Erlanger Mills Power Department installed all equipment and piping. J. E. Sirrine, Engineers, Greenville, South Carolina, were the consultants.

By SMITH CROW, Vice President, Erlanger Mills, Inc.

Case 49 — Florida

Accurate Heat Control



CITRUS By-Products Co., Lakeland, Florida, manufacturers of complete dehydrating feed mills, installs 10 kw Chromalox electric oil circulation heaters to maintain correct temperature of oil to burners on direct fire dryers processing citrus waste into dairy feed.

Since smoking or oil smudging of feed makes product worthless, burners are adjusted to give clean flame at oil temperature of 210 F and with capacities up to 250 gallons per hour of Bunker C fuel oil. It is imperative that flow of oil from steam heaters at the tank be maintained at constant temperature by a more reliable and less variable method than steam regulators. The Chromalox heater acts as a modulating booster heater during the operating cycle, raising the oil temperature from 190 F to 210 F.

Wet citrus pulp at Kraft Foods' mill shown in the photo enters dryers where contact between direct hot gases and pulp quickly drys feed in approximately ten minutes, preserving a large proportion of vitamins and essential food values. Dried feed then passes to coolers, automatic scale and bag sewing machine on way to dairies as prime feed.

By DAVID S. PROSSER, JR., Executive Vice President, Citrus By-Products Co., Lakeland, Fla.

INSTALLING CONTRACTOR: O. A. WENDT COMPANY, CHICAGO

1300 FEET of trench were needed, without special preparation or forms. Note simple concrete supports—no anchors are evident.

EXPANSION LOOP demands only additional GILSULATE on one side of each loop leg in the direction of expansion.

Midwest manufacturer chooses GILSULATE® for plant expansion program

New underground steam lines protected with Triple-Zone insulation system

When one of the world's largest manufacturers of heavy-duty engines expanded plant facilities, the company chose GILSULATE to insulate and protect their hot underground piping system. They knew that GILSULATE gives maximum insulation and corrosion protection against commonly-encountered underground conditions. And they knew too that GILSULATE's low cost for the *complete* installation could not be matched by any other underground pipe insulation.

This typical GILSULATE installation runs for 1300 feet from the plant's main boiler room to the new parts building. Included in the system are a 14-inch steam line, an 8-inch steam line, and a 6-inch condensate return. The line carries 150 pounds of steam pressure with superheat.

Your local GILSULATE distributor will be glad to show you all of the advantages of the modern, efficient GILSULATE Insulation System. Complete details are yours for the asking. Write the office nearest you today.

GILSULATE IS POURED AND TAMPED easily and quickly. Leap frog sheet metal forms conserve material; bulldozer handles backfill.

Facts about Gilsulate

1. **EASY TO USE**—just pour and tamp... pipe heat does the rest.
2. **FORMS 3 ZONES** of protection against heat loss and all hazards commonly encountered by hot buried pipes.
3. **NEEDS NO HOUSING OR MECHANICAL SHEATHS**: no mixing, special handling or equipment.
4. **ONLY NEEDS NORMAL PIPE SPACING**: for multiple pipe or cramped conditions.
5. **THREE TYPES AVAILABLE:**
   Type A for 220°-300°F. temp. range
   Type B for 300°-385°F. temp. range
   Type C for 385°-520°F. temp. range

Do you receive PIPE INSULATION NEWS? ASK to be put on our mailing list.

THE TRIPLE-ZONE INSULATION SYSTEM FOR LIFE-TIME PROTECTION OF UNDERGROUND HOT PIPES

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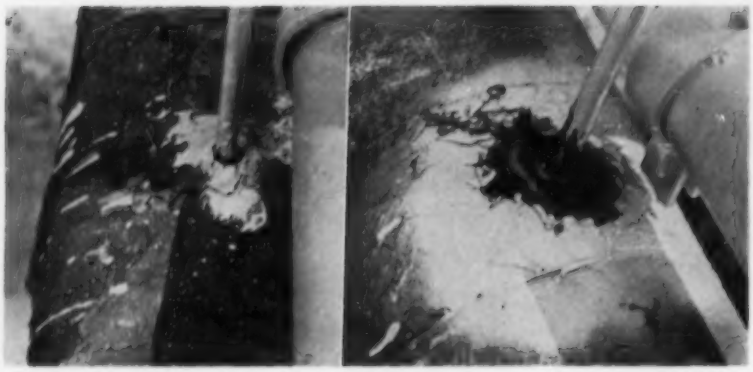


Case 50 — Texas Chemical

Insulation Repairs

THE Works Engineering Department of the Longhorn Division of Thiokol Chemical Corporation has solved, with the use of a new synthetic rubber compound, the old problem of cracked and leaking insulation blankets.

The miles of outside steam line and acres of tank insulation at this plant have resulted in a large yearly insulation repair cost. The problem was analyzed and the major insulation failure was singled out as being a breakdown of the weather-proof asphaltic type mastic. The mastic was hardening, cracking and pulling away from metal parts, such as pipe hangers and bulkheads. This left wide cracks in which rain water entered with resulting insulation failure. A permanent repair was made by resealing these cracks with a synthetic rubber compound known as PRC Expansion Joint Sealant, manufactured by Products Research Company of Los Angeles, California.

This compound is a quick-set polysulfide rubber that air cures to a flexible gasket, adhering tightly to most any type of material, including steel and concrete. This method proved to give a tight seal with the flexibility of live rubber to absorb expansion movement.

By L. E. FRASER, Mechanical Engineer, Thiokol Chemical Corporation, Marshall, Texas.

Case 51 — West Virginia

Modified Crushers Use Cheaper Coal

UNITS 5 and 6 at West Virginia Pulp & Paper Company in Covington, Virginia are pulverized coal fired steam generating units installed in 1934 and 1938 respectively. The pulverizers were originally designed to develop the maximum continuous rating of the boilers when supplied with coal of approximately 100 grindability, 14,500 Btu per pound.

Due to limited supply and relatively high cost of this type of coal, studies were made regarding the practicability of modifying the existing fuel burning equipment so that the capacity of the steam generating units could be maintained when burning coal of approximately 50 grindability, 13,400 Btu per pound.

Riley Duplex Feeder Crusher

Analysis of modification cost and potential savings indicated that the project would be self liquidating in approximately two years.

Modification consisted of the following:

1. Installation of tungsten carbide faced grinding elements in the three existing Riley duplex pulverizers on Unit No. 6.
2. Addition of three Riley duplex feeder crushers.
3. Installation of hot gas connections between furnace and feeder crushers.

Past experience has shown that the tungsten carbide faced grinding elements have a satisfactory service life on low grindability coal. The duplex feeder crusher is designed to flash dry and crush the fuel to ⅛" minus before entering the pulverizer. When this is accomplished the capacity of the machine is maintained without respect to surface moisture.

The proposed modifications were effected during March and April of 1957. Current reports of operation indicate that the predicted performance will be realized.

Case 52 — Texas Utility

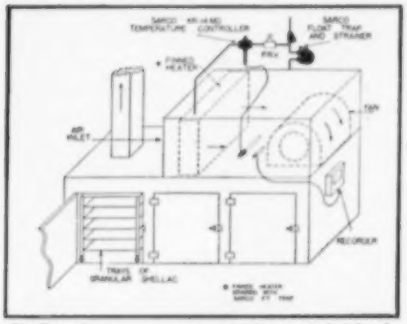
New Boiler Cuts Cost Increases Output

TEXAS Electric Cooperatives, Inc., Lufkin, Texas, operate a pressure treating plant. They had a battery of two boilers installed; one a shell boiler 72" dia. by 18' long nominally rated at 150 hp and a 90 hp LFT boiler, commonly referred to as an "oil field pot."

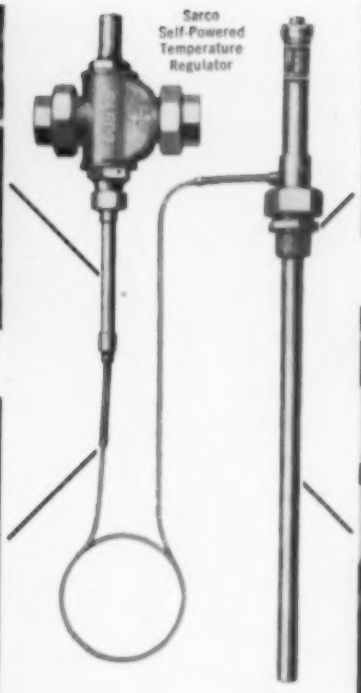
One boiler was equipped with automatic controls and the other "hand" fired. The operating pressure was about 125 psig. There were times during peak steam demand when the boilers would prime and it was extremely difficult to hold a constant temperature in the treating cylinders. Furthermore, fuel costs were excessive.

On Monday, June 3, 1957 a 300 hp Amesteam Generator was put in service. Fuel consumption the

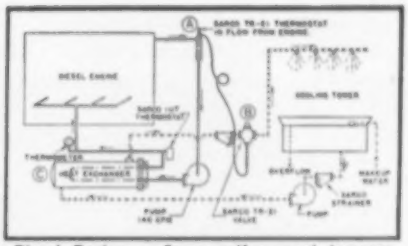
Water storage tanks — Sarco self-powered temperature controls on service water storage tanks from twin heaters.



Shellac dryer — even temperature maintained; moisture uniformity of granular shellac accurately controlled — by Sarco self-powered temperature control.



FOR YOUR INDUSTRY
Chemical Processing • Metalworking
Food • Textile • Paper
Oil Refining • Others



Diesel Engine — Sarco self-powered temperature controller used on diesel engine cooling system. Also ideal for compressors.

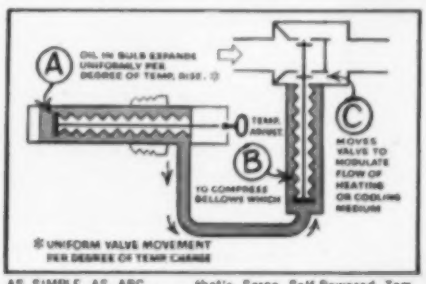
Steam-jacketed kettle — desired temperature of kettle content is automatically maintained by Sarco self-powered temperature control. Steam waste, uncertainty of manual control eliminated.

How to get Automatic Temp. Control that's simple, dependable, inexpensive

HERE'S the way to get rid of uncertain, time-wasting manual temperature control . . . *throughout* your plant. And without investing in complicated, costly temperature control equipment.

These SELF-POWERED Sarco controls are inexpensive, simple, dependable, accurate. They can be used for 85% of your jobs. ½" size costs only about $100!

Thousands of these Sarco controls are giving dependable, accurate service for firms such as Colgate-Palmolive Co., Sinclair Refining Co., Swift and Co.



AS SIMPLE AS ABC . . . that's Sarco Self-Powered Temperature Control. A thermostat with capillary tubing and a valve . . . that's all there is to it!

SARCO SELF-POWERED TEMPERATURE CONTROLLERS
—need no power source

1. Self-Powered — no compressed air or electricity needed.
2. Easy to install — by any pipe-fitter.
3. Self-contained — no exposed mechanism. Packless valve.
4. Simple — no gadgets that take a technician to read and repair.
5. Not affected by cross-ambient temperatures or elevation of the bulb.

Send for Bulletins: No. 620 — Self-powered Temperature Controls. No. 710 — Self-powered Cooling Controls. No. 1025 — Electric Indicating Temperature Controls. Sarco Company, Inc., 635 Madison Avenue, New York 22, N. Y. 2208-8

SARCO
Automatic Temperature Control

ELECTRIC INDICATING AND SELF-POWERED TEMPERATURE CONTROLLERS • STEAM TRAPS • STRAINERS

FOR STEAM TRAPS, SEE SARCO AD, PAGE 7

first month of operation was reduced about 30%. This 30% figure cannot be considered as accurate since the meter reading was taken from May 24 to June 24 and six (6) steaming days would have to be assessed against the old boilers, which were in operation through May 30th. Therefore, a 36 to 38% saving in fuel will be realized by the Texas Electric Coop.

This plant is in operation 24 hours a day, six days a week. Three firemen, who were originally employed full time to operate the old boilers, have been transferred to another division of this company. An additional saving of some $600.00 per month in labor is being realized.

To summarize, The Texas Electric Cooperatives, Inc. will realize about a $15,000 annual saving. No maintenance saving is included in this figure. Treating costs per cubic foot have been reduced 36%. Priming of boilers is no longer a factor to be contended with and a much better quality of steam is available in this process. Also of prime importance is the fact that production can be increased by 20% to 25%.

Case 53 — North Carolina

67% Increase

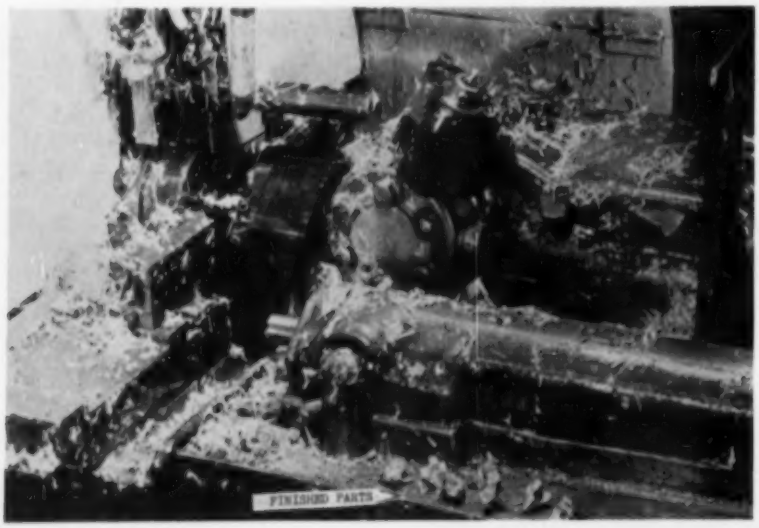
THE Perfecting Service Co., Charlotte, North Carolina now enjoys a 67% increase in production in the manufacture of a socket valve body part with the use of Automatic Screw Machines completing all operations.

This part was formerly blanked out in an Automatic Screw Machine. Three milling operations were then performed on a milling machine using a rapid index fixture. Finally, a burring operation was necessary to remove burrs left on the external portion of the milled section.

Now all operations are completed on a Brown & Sharpe No. 2G Automatic Screw Machine at a 67% increase in production time and no second operations are required. To perform the milling operations on the screw machine, three turret milling spindles, motor driven, are used. The forming operations are completed with the form tools positioned at the front and back cross slides. The cutting off is completed with the vertical slide.

Since the three milling heads are used, it is necessary to index each head into position, and a spindle brake locks the spindle to enable the proper angular position for each milling head. After completion of the milling operations, the form tool is brought up the second time to remove any burrs.

Close up view of the milling heads on the screw machine turret



Case 54 — Virginia

Chemical Cleaning

A DAIRY in Virginia had a very heavy scale formation in their fire tube boiler. Efficiency was extremely low, and maintenance expense due to blistered and ruptured boiler tubes was high.

Prior to initiating a chemical feedwater treatment the Industrial Products Company's (Atlanta, Ga.) Sales Engineer recommended chemically cleaning the boiler with Ipco Scale Solvent. The solvent completely cleaned the boiler, and it was placed back in service in less than twelve hours. Proper inhibitors in the solvent eliminated all danger of damage to the equipment.

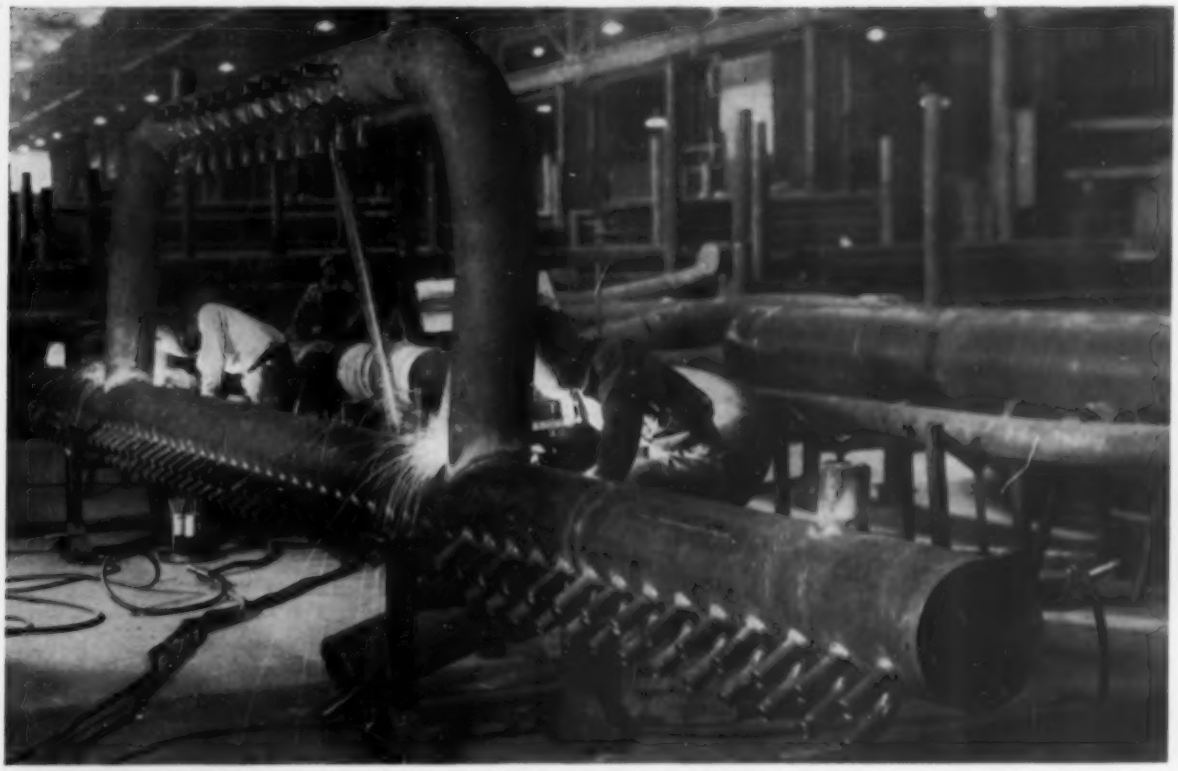
The boiler insurance inspector reported the boiler in excellent condition after the cleaning job.

A CANDY manufacturer in Georgia had a serious problem on his hands when the pressure in his evaporative condenser became very high due to scale formation which was seriously affecting the efficiency of the condensers.

After a thorough examination of the equipment the Ipco Engineer recommended that the system be cleaned using Ipcomic Scale Solvent. Since this is a dry material, it is considerably safer and easier to handle than muriatic acid cleaners. No corrosive fumes are emitted during its use.

The Ipcomic Scale Solvent was dissolved in water and poured into the sump. After circulating for forty-five minutes the line pressure in the condensers dropped from 240 psi to 180 psi. All of the scale was cleaned from the evaporative condenser, and a program of treatment to prevent further scale formation was set up by the Ipco Engineer.

EXACTLY as you want it . . .



Bending

Stress-relieving

Ultrasonic Testing

Shop-fabricated piping by Grinnell

With Grinnell shop-fabricated piping — cutting, fitting, welding, and assembly "on location" is reduced to an absolute minimum. That can be important. For when these operations are performed under the less-than-ideal conditions existing in the field, there is always the possibility of less-than-perfect results. For example, errors in cutting or fitting can occur — or welds can contain slight imperfections, which may be difficult to detect and correct with field equipment.

In Grinnell shops, on the other hand, whole sections of complex piping are assembled *exactly* as you want it — with every critical point checked with the latest equipment and by the most modern methods. When these sections arrive on site, they go up fast and *right*.

With Grinnell shop-fabrication too, there are no unforeseen costs. Included in the price (which is determined in advance) are such items of expense as: interpretive engineering, shop sketches and planning, procurement of materials, power services, expendable tools and supplies. There are no charges for waste material.

Consider the quality of the finished job, and final cost. Then consult Grinnell on *your* next piping installation.

To Engineering Societies and Departments: A 30-minute color sound film showing the quality and economy of Grinnell Shop-Fabrication of all classes of piping is available without charge. Contact your local Grinnell Supply Sales Office, or write to Grinnell Company, Inc. 224 West Exchange St., Providence, R. I.

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic fire protection systems • Amco air conditioning systems

SPANG CW Steel Pipe is uniform, making welding easy. Mr. Cavanaugh reports it to be very adaptable to machining and bending, too.

Exterior of Burroughs Building #4 at Plymouth, Michigan. Building area is 310 ft. x 600 ft., will be used to produce new electronic and electro-mechanical business machines.

General Contractor:
Barton-Malow Company, Detroit, Michigan
Mechanical Contractor:
John E. Green Plumbing & Heating Company, Highland Park, Michigan
SPANG Distributor: W. T. Andrew Company, Detroit, Michigan

"We chose SPANG® Steel Pipe because of its performance record"

...says Mr. William T. Cavanaugh, General Foreman
John E. Green Plumbing & Heating Company, Highland Park, Michigan

"Burroughs Corporation required above-standard competitive-priced steel service piping at its new Building #4 of the Plymouth, Michigan, Manufacturing and Engineering Division," stated Mr. Cavanaugh. "The intricate production of new electronic and electromechanical equipment dictated it, because any malfunction of the service piping could seriously impede the production effort of the entire plant.

"After examining the performance records of various piping products in similar plants, we concurred on using SPANG CW and Lapweld Steel Pipe. It will be used for domestic hot and cold water supply, natural gas, steam and condensate lines, sprinkler systems and compressed air lines.

"This SPANG Pipe must be impervious to severe weather conditions, structural stresses and underground faults. From previous experience with SPANG, we know that their standards of production guarantee such performance.

"SPANG Pipe is also used at four other Burroughs plants in the Detroit area because of its high tensile strength, good interior and exterior finishing and its adaptability to machining and bending. Its corrosive-resistant qualities are above standard, and we have been pleased with the delivery schedules, especially on rush orders."

SPECIFY SPANG AND GET QUALITY

Performance records like this can be yours, too, with SPANG Steel Pipe. The quality-controlled manufacturing and careful testing and inspection of the finished pipe before shipping assure you of a top-quality product for every type of piping installation. Your nearby SPANG Distributor is ready to serve you. Call him about your next job.

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DIVISION OF THE NATIONAL SUPPLY COMPANY
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SPANG® CW STEEL PIPE

John E. Green Plumbing & Heating Company's General Foreman, William T. Cavanaugh, reports SPANG Pipe was specified after comparing delivery and performance records of other pipe in similar installations.

Painters apply protective finish to piping installation. SPANG CW Steel Pipe serves water, gas, steam, sprinkler and compressed air lines at the Burroughs Plant.

NEW Catalogs & Bulletins

STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

1—Package Boiler — New compact, low cost package unit (oil or gas fired) for small space requirements is described in Bulletin DK-1. Pressures to 325 psi, steam capacities to 45,000 lb/hr. — E. KEELER CO.

2—Water Tube Boilers — Shop-assembled "package" gas-oil or combination fired units described in 8 page brochure. Pressures to 600 psig; 1,000 to 20,000 lb/hr — design features, installations. — VULCAN STEEL TANK CORP.

4—Steam Generators — Bulletin AXY-1 describes auxiliary equipment and design features of the Amesteam Generator for sizes 10 through 600 hp and illustrates how this integrated design reduces cost and increases life and reliability. — AMES IRON WORKS, INC.

6—Packaged Plants — Catalog 711 describes how steam at point of use cuts costs for process industries. Packaged generators are fully automatic, burning oil, gas, or both in combination. 18 sizes from 20 to 600 bhp and for pressures to 250 psi. — SUPERIOR COMBUSTION INDUSTRIES.

11—Feedwater Treatment — Bulletin describes liquid and dry (Braxon & Flako) boiler feedwater treatment recommended for removal and prevention of scaling and corrosion during use of many types of water and for prevention of foaming and carryover. — ANDERSON CHEMICAL CO.

13—Power Plant Equipment — 12 page booklet No. 1022-A gives details on combustion and boiler feedwater control, pressure reducing, desuperheating and automatic soot blowing — retractable and rotary. — COPES - VULCAN DIVISION, BLAW-KNOX COMPANY.

16—Small Boiler Performance — Brochure shows how the packaged Ljungstrom air preheater boosts performance. Boilers as small as 25,000 lb/hr can have advantages of regenerative preheating—saves fuel, boosts output, and permits use of lower grade fuels.—THE AIR PREHEATER CORPORATION.

17 — Unit Steam Generators — Bulletin 2000 describes units operating under a negative pressure, with induced draft fan completely purging the entire pressure vessel of any stray raw gases before and after firing. Have tube sheet protective device & precipitator for cleaner operation. — PREFERRED UTILITIES MFG. CORP.

25—Packaged Boilers — Bulletin PSG-2 has line drawings, photos, and engineering data on portable type units from 10,000 to 40,000 lb/hr steam capacities. In standard pressures of 175, 250, and 375 psi. — HENRY VOGT MACHINE CO.

44—Fan Stacks — I-D fan, breeching and stack integrated in a single unit described in Bulletin 1-PCD-1. Straight through breeching assures high, predeterminable efficiency. Structural steel requirements reduced and installation simplified. — PRAT-DANIEL CORPORATION.

45—No. 6 Oil Burner — Low pressure air atomizing burner, described in Bulletin AD-158, is rated at 90 gph. Components include latest type of combustion controls. — CLEAVER-BROOKS COMPANY.

50—Coal Crushers — Catalog 784-C describes single and double roll crushers, swing hammer pulverizers for all sizes of plants. — JEFFREY MANUFACTURING COMPANY.

56—Water Tube Boilers — Booklet — Describes details of stoker — oil or gas or combination gas/oil, 10 to 350 hp to 250 psi; designed for easy conversion to any fuel. — QUEEN CITY ENGINEERING CO.

71—Steam Accumulators — Bulletin RA-52-8—Describes well known steam accumulators to balance steam supply and steam demand in intermittent processes such as are found in brewing, food processing, refining, paper and textile plants. — FOSTER WHEELER CORP.

76—Gas Burner — Bulletin — Describes the Rectilinear gas burner, an application of the venturi principle which provides high input through narrow rectangular openings for firing — in a horizontal plane through fire doors or small openings over handfired coal grates or stokers — or for firing in a vertical plane on either side of stoker or oil burner. — THE WEBSTER ENGINEERING COMPANY.

81—Fly Ash and Dust Recovery — Engineering Booklet — Gives data and illustrations on the multiclone mechanical dust collector, showing basic principles and typical application for dust and fly ash recovery. — WESTERN PRECIPITATION CORP.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

103—Fire Pumps — Selection charts and "typical" fire pump specifications featured in 36 p Bulletin B-1500. 120 approved pumps tabulated by Underwriters' and Factory Mutual and listed according to types of drive.—PEERLESS PUMP DIVISION.

104—Fans — Bulletins F-102 & F-200 describe Type "BL" and "BLH" fans offering high stability and efficiency for all classes of ventilation. Type "BLH" designed for high, broad efficiency curve on higher pressure jobs (6¾" water gauge and up). — BUFFALO FORGE COMPANY.

Note Your NEW Reader SERVICE on Advertisements

107—Proportioning Pumps — 4 p brochure illustrates and describes company's proportioning pumps and package chemical feeding units. Includes applications and specifications. — BIRD ARCHER CO.

116—Air & Gas Compressors—Form 3132-A shows complete range of centrifugal and reciprocating units used in process and chemical industries — for all pressures from deep vacuum up to 35,000 psi and capacities up to 165,000 cfm. — INGERSOLL-RAND COMPANY.

122—Industrial Fans—Bulletin 702A covers type XL Fans having 11" thru 60" inlet diameters, pres-

sures to 18" SP, volumes to 130,000 CFM for industrial air and material handling. — CLARAGE FAN CO.

123—Slurry Pump — Catalog describes the new SP-90 slurry pump which permits proportion of slurries in the mix tank to remain constant, with pumping rates variable from maximum to 1/5 of maximum. — MANZEL.

124—Blowers, Fans, Heaters, Drives —Bulletin B-4729 — Describes the comprehensive and complete line of equipment manufactured by American Blower for practically every known air handling requirement and for smooth transmission of power through Gyrol fluid drives. — AMERICAN BLOWER CORP.

131—Rotary Pumps — Bulletin WQ-50, 8 pages — Describes Warren-Quimby Rotex pumps and gives sectional and exterior views, dimensions, engineering data, selection charts, etc. — WARREN PUMPS, INC.

160—Boiler Feed Pumps—12 p Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included.—PACIFIC PUMPS, INC.

INSTRUMENTS—METERS CONTROLS—REGULATORS

203—Open Channel Flow Meters — Bulletin M22-5, 12 pages — Describes principle of operation and engineering features of Bailey Type FF meter which measures the flow of liquids with suspended solids for water supply and waste treatment applications in industrial plants. — BAILEY METER COMPANY.

204—Floatless Level Control — Data sheets PC-37 describe control that is unaffected by surface agitation and equipment vibration. Simple, compact, one adjustment unit.—LESLIE CO.

205—Draft Gages — Bulletins describe inclined, vertical tube, air filter gages, straight line and dial pointer type, minified draft and receiver type gages, velocity gages and pitot tubes, gas analyzers and steam calorimeters. — ELLISON DRAFT GAGE CO.

208—Water Level Alarms—Brochure D1 — Float operated low and high water level alarms and fuel cutoffs, for low and medium pressure boilers, tanks and other vessels. — RELIANCE GAUGE COLUMN CO.

212—Automatic Temperature Control —Data sheets describe versatile automatic indicating temperature control offering many sequence combinations—step-heating, heating and cooling, wide limit control, or temperature control plus operation of signal devices.—SARCO COMPANY.

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SPI READER SERVICE: OCTOBER, 1957

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222—Pressure Regulators — Catalog 76 — Gives complete detailed information covering applications, operation and specifications of Reducing Valves, Pump Pressure Regulators and Back-Pressure Regulators. Included is a simple, practical method for selecting size of regulators. — MASON-NEILAN DIV.

231—Hi-Lo Water Alarm — Bulletin 1010 — Copes alarm has no bellows, no diaphragm, no weights, no floats and uses no differential pressure devices. It has no internal parts to wear or corrode. It is a complete packaged unit, easily installed, needs no support. Colored schematics show how it operates.—COPES-VULCAN.

264—Liquid Level Control — 32 p Bulletin F-4 describes the Level-Trol for automatically maintaining liquid level at desired point in a heater, condenser, exchanger or other vessels. — FISHER GOVERNOR.

267—Remote Liquid Level Indicator —How clear, brilliant readings from any angle are possible with this unit is explained in Bulletin WG-1824. Pointer is always visible, even at extreme high and low water levels. Of manometric type with automatic temperature compensation. — YARNALL-WARING COMPANY.

280—Valve Manifolds — Bulletin 56-1 explains how the new Equa-Safe manifolds stop mercury blowing and damage to differential bellows and diaphragms. Give excellent protection to differential pressure type instruments. Can be completely dismantled without breaking any pipe connections and inlet seat can be dressed up in place. — REPUBLIC FLOW METERS CO.

PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

300—Cast Iron Welding—Data sheets describe the new Xyron 2-25 strontium-aluminum bearing electrode for crack-free welding of gray and ductile cast iron, including Meehanite, Ni-Resist, and for joining cast iron to steel. — EUTECTIC WELDING ALLOYS CORP.

301—Metal Fabrication — Replacement parts for plant maintenance; Sheet, plate & light structural. Brochure describes engineering services for Southern industry. — ENGINEERING SALES.

304—Backing Rings — Bulletin 56-2 describes rings designed for fast economical fit-up in piping, tubing, fittings and valves. Shows how rings assure uniform complete-penetration welds and ease of handling in both shop and field. Carbon steel, wrought iron, chrome alloys, stainless, aluminum and copper.—ROBVON BACKING RING COMPANY.

305—Industrial Heating — Catalog 50, 50 pages — Gives data on the type and size of electric heating units and similar equipment for industrial heating needs. Detailed diagrams and photographs describe applications.—EDWIN L. WIEGAND CO.

306—Steel Buildings — Catalogs cover Series S buildings (clear span widths from 4-40 ft) featuring Steelox panel construction; and Series P buildings (clear-span widths up to 100 ft); fire resistant & weather tight; simplified design eliminates much job-site labor. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

319—Portable Band Saw — Bulletin describes the Kalamobile, a portable metal-cutting band saw. Has rubber-tired 12" wheels and telescoping handles. Capacity 6" rounds

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— 10" flat. — Machine Tool Div., KALAMAZOO TANK AND SILO CO.

344—Air Compressor — 8 p brochure illustrates and describes the Channel-Flo Compressor, a 2-stage, 200 psig rated motorcompressor available in 1½ and 2 hp sizes. Flange-mounted directly on driving motor. — INGERSOLL-RAND CO.

350—Industrial Space Heaters—Bulletin GC 4-55 describes complete line of oil or gas fired Thermobloc industrial heaters for any size job. Completely self - contained, fully automatic. — THERMOBLOC DIV., PRAT-DANIEL CORP.

351—Steel Grating & Treads—Bulletin 2486 describes electroforged steel grating and treads, their advantages and typical successful applications. — BLAW-KNOX EQUIPMENT DIVISION, BLAW - KNOX COMPANY.

375—Welding Service — Sheet TIS 2600 describes new welding advisory service. Survey highlights operations where metal joining, machinery repair and overlaying for wear resistance can be increased profitably. — EUTECTIC WELDING ALLOYS CORPORATION.

384—Floor Grating — Catalog No. AT254 — Describes company's free planning and checking service for completely custom fabricated floor grating installations.—BORDEN METAL PRODUCTS CO.

PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

406—Blow-Off Valves — Catalog B-434 describes the valve to use for boilers to 2500 psi. Disc has welded-in stellite facing and inlet nozzle has integral welded-in heavy stellite seat. — YARNALL-WARING COMPANY.

410—Piping Insulation Manual — "Technical Data Manual," 20 p booklet, gives engineers all available information on the application of Gilsulate, a new insulation for underground hot pipes. Describes three grades, how to determine ditch size for various pipes and types of soil, and gives sample problems.—AMERICAN GILSONITE COMPANY.

416—Control Valves—Illustrated Cat. 305 contains detailed specifications on air-operated control valves. All usual types are described. Technical data are included as an aid to selection. — MASON-NEILAN DIV.

418 — Diaphragm Control Valves— Complete facts on company's ¾" to 6" valve line given in Bulletin CV53. Design features large flow coefficient.—KEILEY & MUELLER, INC.

422—Motor Pump — Liquid handling applications described in general bulletin. Sizes from ¼ to 75 hp, 5 to 2800 gpm with heads to 650 ft. — INGERSOLL-RAND.

429—Expansion Joints — 8 p Bulletin EJ-1915 describes Type W Gun-Pakt expansion joint which features an improved one-piece design of body and gland. Includes data on figuring expansion of pipe lines and suggestions for installing expansion joints. — YARNALL-WARING CO.

433—PVC Fittings & Flanges — Corrosion resistant polyvinyl chloride pipe fittings & flanges covered in 12 p catalog, featuring characteristics, advantages, limitations, operating pressures, temperatures, field tests, etc. — GRINNELL COMPANY, INC.

446—Valve Performance Facts — 32 case histories covering valve installations throughout industry. — CRANE CO.

455—Plastic Valves & Fittings — Brochure covers company's extensive line of new corrosion-resistant valves and pipe fittings molded from rigid polyvinyl chloride. — WALWORTH COMPANY.

456—High Alloy Casting & Pipe — Bulletin 3354G explains how static and centrifugal castings & pipe offer maximum resistance to heat and corrosion. — THE DURALOY COMPANY.

470—Aluminum Jacketing — Applicable for protecting lines, tanks, towers, or vessels. Booklet shows simplified inexpensive applications in process industries, commercial buildings, etc. — ASEECO, INC.

MAINTENANCE PACKING GASKETS, LUBRICATION

500 — Liquid Separator Filter — Catalog describes Fram Space-Saver Units, for removing water from liquid hydrocarbons by filtration. Units engineered for easy installation and maintenance and are designed for a wide variety of applications — up to 69 gpm. — WARNER LEWIS COMPANY.

502—Hazardous Liquid Gasket Material — How type 662 gaskets can stand varying climatic conditions without drying, shrinking, or hardening described in Bulletin AD-146. For use against gasoline, water and oil at temperatures up to 300 F. Has Underwriters' Laboratories, Inc. approval. — THE GARLOCK PACKING COMPANY.

506—Gage Glass Cleaning Tool — Data sheet No. 301 describes tool which uses brushes to quickly and efficiently clean inside of liquid level gage glass. — JERGUSON GAGE & VALVE CO.

509—Rust Solvent — Data sheet describes "Liquid Wrench" a penetrating rust solvent that loosens rusted bolts, nuts, screws and "frozen" parts. Safe for all metals and alloys. — RADIATOR SPECIALTY CO.

511—Maintenance Ideas—"Genius at Work" — Contains ideas about plant maintenance, bits of philosophy, new products and a description of the company's line. — KANO LABORATORIES.

512—Lubricator Vacuum Type Pumping Unit — If your plant is experiencing difficulty with visibility and excessive maintenance on lubricator sight glasses, the new 82 vacuum pumping unit will offer lower costs. Form 1263 gives principle of operation and advantages—MANZEL.

523—Boiler Gaskets — Catalog describes wire-inserted woven asbestos and spiral wound metal-asbestos — for manholes, handholes and tube caps of all makes of stationary and marine boilers, water walls, economizers, etc. — THE BELMONT PACKING & RUBBER CO.

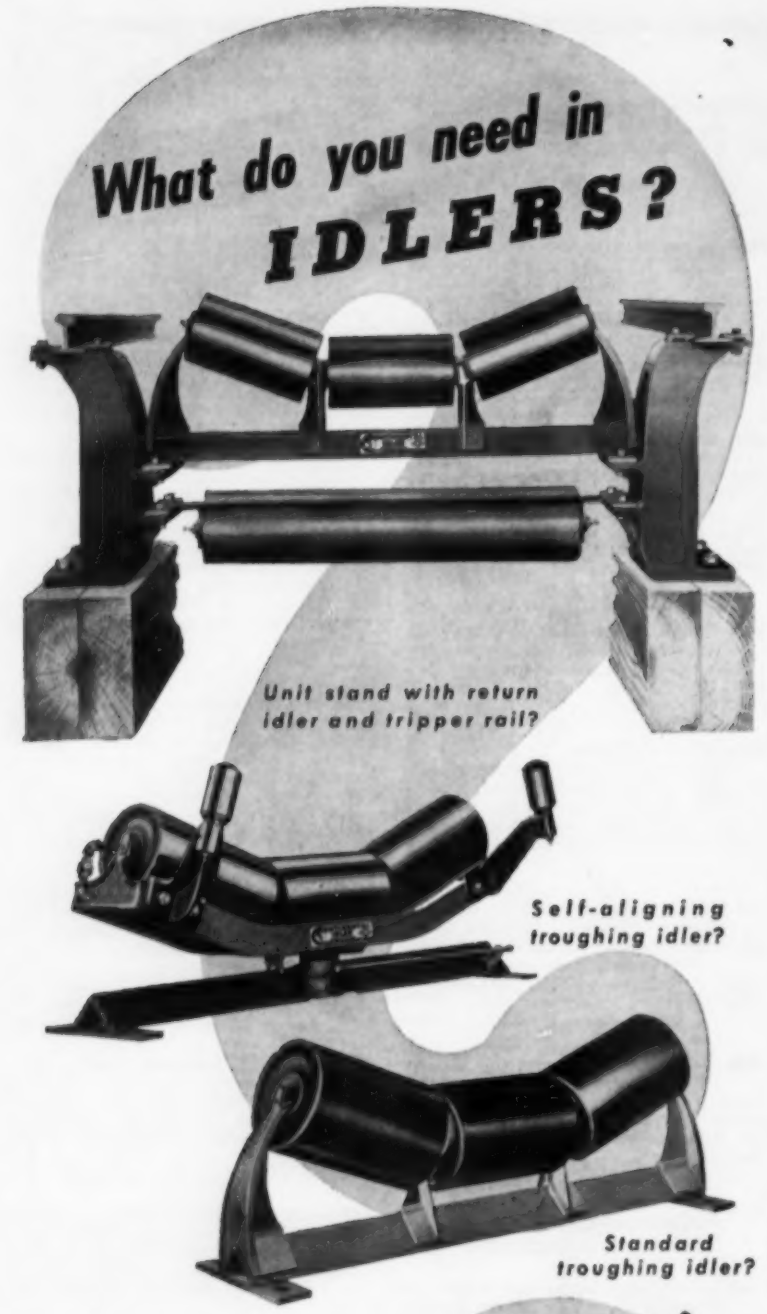
540—Welding Charts — Wall training charts TIS 2690 (Torch) and TIS 2689 (Metallic Arc) designed to fit into welding training programs. Correct welding procedures illustrated. — EUTECTIC WELDING ALLOYS CORPORATION.

552—Packing Removal Tool — Bulletin DHSP describes the Dura Hook that "works around corners" for removing old packing from stuffing boxes.—DURMETALLIC CORPORATION.

561—Return Line Corrosion — Bulletin CP-100 discusses Amine treatment, an effective and economical way to eliminate corrosion troubles. — THE BIRD-ARCHER COMPANY.

594—Corrosion Control — Booklet, 20 pages — "Corrosion Control of Electric Light and Power Structures and Equipment" is designed to give company field operating men practical painting information on all phases of transmission and distribution work. Applicational photographs. — SUBOX, INC.

595—Tube Cleaners & Expanders — Catalog 77 covers tubes in high pressure boilers, superheaters, economizers and other heat exchange equipment. Model 38 expander rolls and flares in single operation. — THOMAS C. WILSON, INC.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Bulletins (Cont'd)

598—Valve-in-Line Reseaters—Bulletins describe power-driven, one-man operated reseaters (pneumatically or electrically powered) for modern gate and globe valves. Reduces grinding time to minutes. Saves money on valve inventory and maintenance. — THE LEAVITT MACHINE COMPANY.

ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

600—Conveyor Idlers — Bulletin SI-116 describes pre - lubricated "UST" Conveyor Idlers. Incorporating Timken bearings and Garlock Klozures, construction permits operating without lubrication for 1-3 years or more. — CONTINENTAL GIN COMPANY.

601—Fluid Drive — Bul. 9819 describes features of improved Type T Gyrol Fluid Drive for general industrial applications. Applications and advantages noted; rating charts give hp ranges for various engine and electric motor drive speeds. — AMERICAN BLOWER CORPORATION.

609—Variable Speed Pulleys — Bulletin 118 describes units with ⅛" to 1⅝" bores (max.); 3" to 13⅝" O.D.; A to 2¾" TW belt sizes; 1-1 to 8-1 speed ratios; and ¼ to 15 hp (1759 rpm) — LOVEJOY FLEXIBLE COUPLING CO.

610—Flexible Couplings — All metal couplings described in Catalog 51A have no wearing parts; offer freedom from backlash, torsional rigidity; free end float; smooth continuous drive; and visual inspection in operation. — THOMAS FLEXIBLE COUPLING CO.

613—Monorail Applications — Bulletin C-1 — "Handling Problems Solved"—gives hundreds of illustrations of monorail applications to handling problems in various industries. Equipment advantages also illustrated. — AMERICAN MONORAIL CO.

614—Vertical Transportation — Elevator Catalog — Describes and illustrates details of passenger and freight elevators, escalators, dumbwaiters, and modernization and maintenance equipment for use in industrial, utility and service plants. — OTIS ELEVATOR CO.

626—Personnel Elevators — Industrial personnel elevators, available in 1, 2, and 4 passenger sizes (300-1,000 lb capacity), described in Catalog 5A-156. Gives specifications

Engineer's Books

Pipe Friction Manual

Published by **The Hydraulic Institute,** 122 East 42nd St., New York 17, N. Y.; 87 pages; Price, $1.75.

Manual is an extension and rearrangement of the pipe friction data contained in an earlier publication, "Tentative Standards of the Hydraulic Institute — Pipe Friction."

Demonstrates mathematical calculations used in construction of later charts, supplemented by complete tables of friction loss for water in feet per 100 feet of pipe. Covers wrought iron, steel and cast iron pipe sizes from ⅛ in. nominal to 84 in. id. Numerous examples show actual mathematical solution to pipe friction problems.

Principles of Electric Utility Engineering

By **Charles A. Powel:** Published by **The Technology Press,** Massachusetts Institute of Technology, Cambridge, Mass. and **John Wiley & Sons, Inc.,** 440 Fourth Ave., New York 16, N. Y.

The author has selected those problems which he finds basic to the design and operation of a utility and presents them in a framework of engineering philosophy, discussing the long-established principles behind the problems. Covers essential features of the entire field of Electrical Engineering in one volume.

Air Pollution Handbook

Edited by **Paul L. Magill,** Senior Scientist; **Francis R. Holden,** Senior Chemist; and **Charles Ackley,** Editor, Stanford Research Institute; Published by **McCraw-Hill Publishing Co.,** 327 W. 41st St., New York 36, N. Y.; 720 pages; Price, $15.00.

A number of specialists discuss causes, effects and control of air pollution and give pertinent facts in determining the nature, extent, and effect of air pollution in specific situations and in carrying out an effective program for abatement. Each contributor chosen because he could speak authoritatively on one or more phase of air pollution.

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Gentile* FLOW TUBES

are impact-type head meters or differential producers.

They are designed to give you guaranteed high accuracy with lowest head loss.

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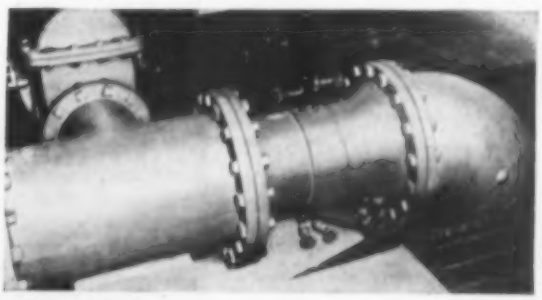
You also get:

LOW FIRST COST—Gentile Flow Tubes are economical to purchase.

LOW OPERATING COST—Gentile Flow Tubes require minimum maintenance. Where purging or back-flushing is a normal routine, the Gentile Flow Tube can be arranged for constant or intermittent purging without removing from the line.

LOW INSTALLATION COST—Gentile Flow Tubes can be installed with no straight run upstream or downstream, except where near valves or regulators.



Actual installation of a 16" Flow Tube for REVERSE FLOW. Note fittings (elbow and tee) are bolted directly to flanges of Flow Tube.

Gentile Flow Tubes can be furnished with or without suitable secondary indicating, recording, or totalizing instruments.

GENTILE Flow Tubes are manufactured exclusively by Foster Engineering Co.

Write for further information or specific recommendations.

FOSTER ENGINEERING COMPANY

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This AIR-COOLED CONDENSER produces a Higher Vacuum

● Using air as the cooling medium, the Niagara *Aero* Vapor Condenser produces a higher vacuum than other type condensers, and with more economy of power and steam.

It sustains its full capacity in cooling or condensing with no more than a nominal cooling water requirement, eliminating entirely your problems of water supply and disposal.

It holds constant the liquid or vapor temperature producing always uniform products and giving maximum production.

Non-condensibles are effectively separated at the condensate outlet, with sub-cooling, after separation for higher vacuum pump efficiency.

Niagara *Aero* Vapor Condenser can be mounted directly on the steel structure of your evaporator or distillation column. Its operation is dependable; its maintenance is not troublesome or expensive.

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District Engineers in Principal Cities of U. S. and Canada

Bulletins (Cont'd)

and dimensional layouts. — J. B. EHRSAM & SONS MFG. CO.

640—Flexible Couplings — Catalog 7 gives hp ratings, dimensions, maximum rpm and other data necessary in selection of correct coupling. — DIAMOND CHAIN COMPANY.

666—Electric Power Drives — Bulletin 185 contains cut-away drawings illustrating various features of variable speed and slow speed gear reduction units, and totally enclosed splash-proof motors. Includes mounting and control information. — STERLING ELECTRIC MOTORS.

669—Universal Joints — Bulletin 820 describes joints with ¼" to 2" bores; ½" to 4" hub diameters; 340 to 130700 in-lbs static torque; and ½ to 2-7 hp (100 rpm) — LOVEJOY FLEXIBLE COUPLING CO.

WATER TREATMENT, HEATING VENTILATING, AIR CONDITIONING REFRIGERATION, DUST & FUME CONTROL

700—Water Conditioners — 4 p brochure describes Anco water conditioners for hot-water and humidifying systems. Stop rust and corrosion; prevent discolored water. — ANDERSON CHEMICAL COMPANY, INC.

701—Exhausting Corrosive Fumes — Bulletin 702-A shows how corrosive fumes can be exhausted with rubber, lead lined or specially coated fans. — CLARAGE FAN CO.

703—Air Conditioning—Bulletins 112 & 122 describe "controlled humidity" method where cooling and heating functions are made completely separate from adding or taking away moisture. No moisture sensitive instruments needed in flexible & compact design.—NIAGARA BLOWER CO.

711—Refrigeration Condensers—Bulletin RC-2 shows how Vogt condensers step up rate of heat transfer and step down head pressures. Closed type for clean waters; film type where water is hard and forms scale. Units save power and refrigeration cost. — HENRY VOGT MACHINE COMPANY.

712—Ion Exchange Equipment — Bulletin A-255 describes the various methods of ion exchange treatment which provide suitable boiler feedwater, process water, and purified solutions. — ILLINOIS WATER TREATMENT CO.

714—Industrial Heaters — Bulletin P-154 — Describes "Panelbloc" infra-red unit heaters available in 62,500 btu and 125,000 btu input. No fan, motor, or electrical connection is needed. Heating is accomplished by guided radiation. The units may be used with any commercial type gas fuel.—THERMOBLOC DIV. OF PRAT-DANIEL CORP.

716—Dust Collection — Whether nuisance elimination or process material recovery check on Whirlex Dust Collector Units. Engineering data available. — THE FLY ASH ARRESTOR CORP.

718—Zeolite Softeners — 20 p catalog 4520 describes the sodium zeolite softening process in detail. Contains data required for proposals, lists factors important in selection of proper zeolite material and in sizing of equipment. Single valve controls all cycles of service and regeneration. — COCHRANE CORPORATION.

720—Power Roof Ventilator — 4 p Bulletin 550 illustrates and describes company's Centrilator, the centrifugal power roof ventilator with the exclusive "jet siphon." Includes capacity and dimension tables. — CLARAGE FAN CO.

723—Dust Collection — Catalog describes mechanical and electrical systems which meet most rigid anti-air-pollution codes; low resistance fly ash collector which combines top efficiency with low draft loss for natural or forced draft installations. — BUELL ENGINEERING COMPANY.

738—Deaeration—Why? How?—Bulletin 4650 explains in capsule form fundamentals of deaeration and why it is so necessary in water conditioning. Principles, advantages, and application of various methods discussed.—COCHRANE CORPORATION.

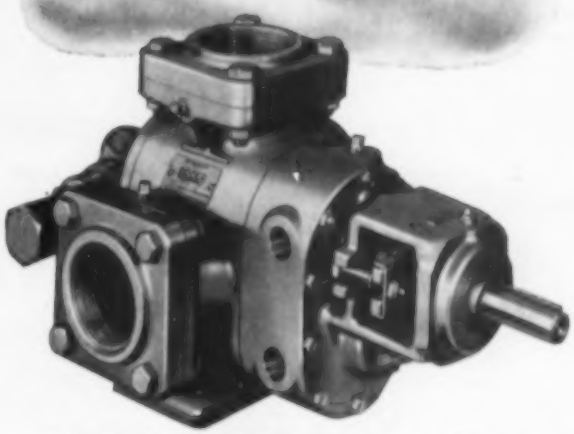
743—Cooling System Cleaning—Bulletins show how Formet crystals will prevent scale formation and corrosion and remove existing deposits. No proportioning devices needed. — THE PEROLIN COMPANY, INC.

764—Cooling Equipment — Bulletin 80-D describes company's complete line of commercial and industrial equipment—operating principles, design features, etc.—FRICK CO.

ELECTRICAL

801—Motors—Bulletin describes and catalogs more popular a-c motors from 1 to 600 hp, for every process and manufacturing requirement. Single phase and polyphase; surpass NEMA specifications. — BROOK MOTOR COMPANY.

NEW ROPER PUMP WITH STEAM CHEST



LOW COST METHOD OF HEAT TRANSFER TO PUMP AND PACKING

Capacities from 27 to 223 GPM
Pressures Up to 100 PSI

This is the same Roper Series 3600 Pump as found in general transfer installations, but with the added feature of a steam chest. A rotary gear unit, it is available with or without relief valve . . . also furnished with gear reduction, if desired.

TWO TYPES OF CONSTRUCTION:

Spec. 3878 Fitted with Bronze Bearings
Spec. 4049 All Iron Construction
All Units Fitted with Aluminum Gaskets and High Temperature Packing

Steam Chest: Located between case and outboard bearing to transfer heat to both pump and packing. A low cost method for handling thick, viscous liquids. Can be used with steam, hot water, or heat transfer oil. Pump and steam chest static tested at 300 PSI. Recommended pressure with steam is 125 PSI.

- Four ports in steam chest for installation convenience.
- Hardened gears and shaft precision ground; steel shaft induction hardened.
- Equipped with high temperature packing (600° F. max.) for effective sealing and long life. Pump fitted with aluminum gaskets.

Send for Bulletin No. 29

Geo. D. Roper Corporation
440 Blackhawk Park Ave.
Rockford, Illinois

ROPER Rotary Pumps

805—Power Factor Correction — 24 page catalog 50B shows how you can cut power costs by installing correction capacitors on motors and other inductive electrical equipment. Greater loads can be handled from existing circuits. Wiring, transformer and switchgear costs can be greatly minimized in new installations.—SPRAGUE ELECTRIC CO.

815—Induction Motors — How spiral ventilation of two-pole motors eliminates hot spots and cuts windage noise described in Bulletin O5B8123A. Fans drive air thru holes in yoke, cooling stator lamination pockets, stator coils and absorbing heat from the rotor. — ALLIS-CHALMERS.

825—Weather - Protected Motors — Bulletin 51B8606A describes features which contribute to outdoor dependability of company's weather-protected motors (Type FOD) in ratings from 250 to 900 hp.—ALLIS-CHALMERS MFG. CO.

841—Applying Electric Heat — "101 Ways to Apply Electric Heat"—Gives illustrated case histories showing experience - tested methods of applying Chromalox electric heating elements. Physical aspects of installation are shown along with the description of the problem, solution and advantages obtained — EDWIN L. WIEGAND CO.

852—Autotransformer Starter—with air break contacts up to 75 hp, 220 v; 150 hp, 440-550 v is described in Bulletin 646. Silver alloy contacts stay in good condition without filing, cleaning or dressing. — ALLEN-BRADLEY.

854—Adequate Wiring — Booklet "Wire Ahead" — Discusses preventive maintenance in electrical systems — the symptoms of inadequate wiring — and plans for anticipating electrical demands. — ANACONDA WIRE & CABLE COMPANY.

855—Wiring Analyzer — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or slide rules. — SPRAGUE ELECTRIC COMPANY.

859—FHP Motors — 16 p Bulletin GEA-6424 illustrates design advantages and shows components in integrated insulation system of general purpose fractional hp motors. Used on power tools, heating and ventilating equipment, compressors, fans, water pumps, and machine tools. — GENERAL ELECTRIC CO.

861—Electrical Protection System — Bulletin HCS—Describes "Fusetron" dual-element fuses which save recalibration and maintenance costs. Eliminates down-periods caused by needless blows and saves on installation costs. Available in all sizes from 1/10 to 600 amperes, both 250 and 600 volt types. Also in plug types for 125 volt circuits. — BUSSMANN MANUFACTURING COMPANY.

INHIBIT
DERMATITIS
AND OTHER
ANNOYING SKIN
INFECTIONS
WITH VI-LAN
ALL-PURPOSE
SKIN CLEANSER
VI-LAN
ANTISEPTIC PASTE CLEANSER
WITH LAN ACT 12
"Keep their hands clean and germ free"
WITH EFFICIENT DISPENSERS
PORTABLE AND STATIONARY
THROUGHOUT YOUR PLANT
Recognized throughout industry as a superior, heavy duty paste-cream antiseptic skin cleanser, VI-LAN fortified with Lan Act 12, is properly dispensed with portable and stationary dispensers conveniently placed on work benches, service trucks, oil rigs, laboratories, store rooms, work carts, lavatories, and in EVERY WASH ROOM. Used WITH OR WITHOUT WATER, Vi-Lan removes greases, oils, paints, tars, acids, asphalt, pipe dope, rubber, etc., inhibits dermatitis, and serves to eliminate lost man hours and expensive compensation claims. It drastically reduces hand-cleaning costs, and removes stubborn soils in less time than conventional soaps and detergents. IT DOES WHAT SOAP CAN NOT DO, and its lanolin content preserves natural skin qualities.
No. 60-70
No. 50
Write for descriptive folder
DAMERON
enterprises, inc.
427 So. 20th Street
Louisville 3, Kentucky

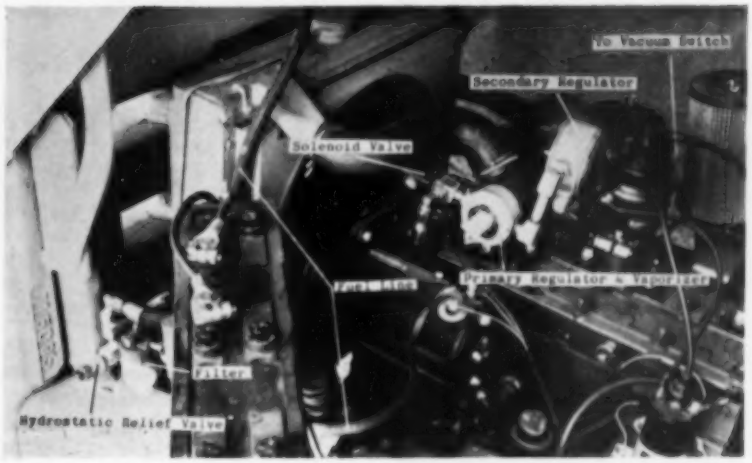
OPERATING AIDS
SUPPLIES & MISCL.

909—Industrial Skin Cleanser—Folder describes Vi-Lan Clean, a non-alkaline, non-acid, all-purpose antiseptic skin cleanser that prevents dermatitis and other skin conditions. Self-service dispensing units. — DAMERON ENTERPRISES, INC.

911—Rescue Kit — Bulletin 733 describes unit and procedures for freeing persons trapped in cars, buildings, under machines, in elevators, etc. — H. K. PORTER INC.

937—Steel Measuring Tapes — Complete catalog describes full line of measuring tapes from 6 to 100 ft, including wide blade tape with upright measurements. — EVANS RULE CO.

NEW Product Briefs



LPG System for Fork Trucks

K-1 A liquified petroleum gas fuel system has been made available as optional power on the new Clarklift line of fork trucks manufactured by **Clark Equipment Company's** Industrial Truck Division, Battle Creek, Mich.

Components of the LPG system are interchangeable on all Clarklift models and incorporate the low maintenance features of Clark's earlier LPG equipment plus additional refinements.

The LPG system requires minimum space and is installed so as not to interfere with any function of the fork truck. A flexible fuel line from the externally-mounted tank to the fuel filter permits opening of the engine hood without disconnection of the fuel line.

Safety features include a 375 psi relief valve built into the tank, valve-mounted excess flow check valve, quick disconnect coupler with check valves in both male and female fittings, solenoid valve, hydrostatic relief valve, fused vacuum switch and a tank guard.

Welding & Cutting Outfit

K-2 An improved Prest-O-Lite No. 420 welding and cutting outfit, which welds up to ¼" and cuts up to 2", has been introduced by **Linde Company,** 30 E. 42nd St., New York 17, N. Y.

Details are given in Form 1079.

Besides a blowpipe and regulators, the new outfit includes four interchangeable tips (3 welding and 1 cutting), 12½ ft of twin hose, goggles, friction lighter, wrench and complete instructions.

Cold Process Asphalt Roofing

K-3 A cold process asphalt roofing compound, developed by **The Panther Co.,** 840 N. Main St., Fort Worth, Texas is recommended for particular application to concrete tilt-up buildings with concrete roofs or to roof decks of steel, wood, corrugated sheet metal, roofing felt, gypsum, plywood, etc.

The new roofing product — "Mightyplate" — is applied cold, can be applied to a wet surface and will refrain from cracking at 60 F below zero, and from running at 200 F. Cost, including labor of applying, is almost one-half that of a conventional built-up roof, using a layer of felt, a layer of asphalt and a layer of gravel. Felt and gravel, and in some cases metal edging, are not necessary in application to concrete roofs.

The Panther Co. claims the new roofing product will last twice as long as conventional asphalt roofing. In the case of asphalt, rapidly formed non-adhesive skins develop when exposed to weather. The film deposited by the new compound retains its adhesiveness for a long period of time. Aging proceeds much more slowly.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 119

Swing Check Valve

K-4 A new renewable composition disc bronze swing check valve has been added to their line of Bronze and Iron Body Valves, according to the **Fairbanks Co.,** 393 Lafayette St., New York 3, N. Y.

Swing check valves are generally recommended for service on liquid lines where full unobstructed flow or minimum resistance to flow is desired. Renewable composition discs protect the valve seat from damage due to solid particles in the steam and from the shocks of pulsating pressures affording considerable savings in replacement costs to users. The discs can be replaced without removing the valve body from the line.

The valves are rated at 150 lb steam working pressure, 300 lb cold water, oil or gas pressure — non-shock. They are available in sizes from one-half through two inches.

Keep plant space flexible with BLAW-KNOX Electroforged® Steel Grating

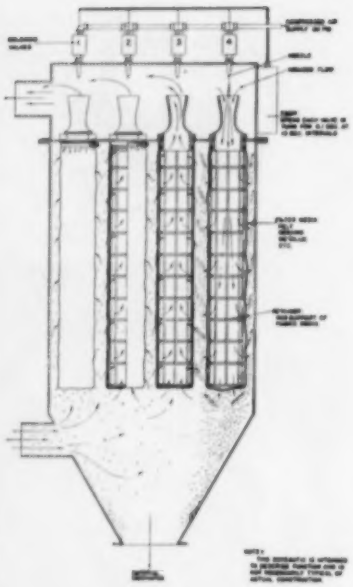
If expanding production set-ups are cramping feeder and storage areas in your plant, it will pay you to check into Blaw-Knox Electroforged Steel Grating.

Storage platforms of Blaw-Knox steel grating put unused space to work easily, economically. There's nothing to wear, nothing to patch. Blaw-Knox Electroforged grating fits neatly around pipes, beams and machinery without any alterations to the building, and, at the same time, admits maximum light and ventilation to the entire area.

Blaw-Knox Electroforged Grating for walkways, stair treads and floors is fabricated to your specifications to meet your own operating conditions. Complete data on all types is contained in Bulletin 2527. Write for your copy today.

BLAW-KNOX COMPANY

Equipment Division
Dept. K, Pittsburgh 38, Pa.



Dust Collector—No Internal Moving Parts

K-5

Since there are no internal moving parts in the new Mikro-Pulsaire Dust Collector, the Pulverizing Machinery Division of **Metals Disintegrating Company,** Chatham Rd., Summit, New Jersey, emphasize that the problem of handling abrasive type materials has been reduced. Maintenance is nil. Toxic or hazardous dusts are handled with a minimum of purging and hazard.

The Model 9 Mikro-Pulsaire Collector consists of nine cylindrical filter elements 4 or 6 ft long, enclosed in a dust-tight housing. Dust-laden air is admitted to the housings and clean air is withdrawn from the inside of the filter elements. Dust material is thereby retained on the outside surfaces of the filters.

Filter element cleaning is accomplished by momentarily introducing a jet of high pressure air through a specially contoured venturi mounted above each filter cylinder. This primary high pressure air pumps additional secondary air via the jet pump process, thus producing a reverse flow fully sufficient to clean the filter cylinders. Since only a single filter tube of the nine is cleared at one time, continuous flow thru the collector is maintained.

The jets are controlled by solenoid valves, actuated by an electrical timer.

The Model 9-4 collector has 42 sq ft of filter area and handles between 400-600 cfm of dust-laden air. Bulletin 52A gives details.

Plant Conversion System for Magnetic Conveyor-Elevators

K-6 A simplified and expanded system for plant conversion of magnetic conveyor-elevators is offered by the **Eriez Manufacturing Company**, Erie 6, Pa. Their non-electric, magnetic Magna-Rail units are available in a greater variety of magnetic strengths and units can be readily constructed thru a simple bolting-together of stock components.

These Alnico V permanently powered magnetic units, fastened under new or existing belt conveyors, quickly transform them into magnetic conveyor-elevators capable of handling ferrous materials and parts at greatly increased speeds, up inclines as steep as 90°, with positive control.

The new line of Magna-Rail units is available in three different strengths and in standard 3', 4', 5' and 6' lengths. All units are so constructed that when they are mounted end to end, using flat-head bolts, they will automatically have correct polarity.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 119

Self-Fusing, Splicing Tape for Rubber & Plastic Cables

K-7 Okoweld Tape, a self-fusing, weather and flame resistant tape by **The Okonite Company**, Passaic, N. J., is recommended for use as both insulation and sheath on cables operating under 2000 volts. Can be used with polyethylene, PVC, butyl, GRS, natural rubber, or neoprene compounds.

Okoweld is a "four-purpose" tape — it protects, insulates, moisture seals and weather-proofs electrical connections. Comes in five colors for coding purposes.

SAVE 1 OR 2 COATS OF PAINT ON YOUR NEW PLANT

Start your new plant with Subox protection and save from the very beginning.

As the only American paints made with lead-suboxide, Subox paints provide extraordinary anti-corrosion protection. Lead-suboxide is *chemically active*: Actually works to prevent corrosion.

Two coats of Subox paint generally will give the protection of three coats of standard paint and frequently but one coat is sufficient. Even under severe conditions, Subox paints do not crack, chip or blister.

Eventual repainting costs are minimized because lead-suboxide establishes a dense, metallic lead film which can be recoated without expensive surface preparation.

Available in many attractive modern colors. Write for brochure: *"Plan Painting of New Plants to Reduce Costs".*

SUBOX PAINTS

Subox Inc.

Established 1924
6 Fairmount Plant
Hackensack, N. J.

custom-made for

754-P

centrifugal pumps

Try Belmont "Centrifugal Packing" 754-P in your plant and keep a check on pump shaft conditions. You'll stay with it.

Belmont 754-P is a "custom-made" packing for centrifugal and rotary pumps, with a reputation as "nothing better for the service."

Lubrication is the secret of its performance. Lubrication that allows free shaft motion. Lubrication that is impregnated into every strand of asbestos yarn. Graphiting that is braided into this packing to stay, throughout its life.

Write for Catalog 56.

ask your BELMONT Distributor

Such leading Packing Distributors as:

Briggs-Weaver Machinery Co. in Dallas

and

Jno. J. Disch Co. in Cleveland

are ready to serve you promptly and helpfully, wherever you are.

The Belmont Packing & Rubber Co.
Butler & Sepviva Sts., Phila. 37, Pa.

BELMONT

New Products (Cont'd)

Program Control of Batching Operations

K-8 A new formula board resembling a simple cribbage board has been introduced by **Richardson Scale Company**, Clifton, N. J., as a means of achieving complete automation in the program control of batching operations.

When the formula board is used for pre-setting weight data in an automatic proportioning panel, it eliminates the need for manual weight settings and the possibility of human error in electronically controlled operations involving the proportioning of bulk materials.

The combination board and panel are used as components in Richardson's Select-O-Weigh system, which provides automatic control over storing, feeding, conveying, weighing, mixing and discharging of bulk ingredients.

Typical applications of the system would include the formulation of feeds, bakery ingredients, rubber compounds and a variety of mixes for chemical processing operations.

The formula board is especially useful for processors using many mixing formulas with frequent changeover. The interruptions involved in changing from one formula to another are eliminated by simply removing one formula board and replacing it with another of predetermined settings. This procedure results in a substantial speed-up of operations, and also makes for greater accuracy since control is no longer subject to error at the hands of an operator.

The operator need only insert formula board into position and press a starter button. The rest is completely automatic, and the proportioning and mixing operations are continued without interruption.

Phase-Voltage Converter

K-9 **Kato Engineering Company,** 1415 First Ave., Mankato, Minnesota, offers a 39 lb Rotating Phase-Voltage Converter, which will convert single phase, 115 volt, 60 cycle a-c to three phase, 230 volt, 60 cycle current. Frequency is held constant within a fraction of a cycle.

Manufacturer emphasizes that while other types of phase converters have been suitable for operating some three phase motors, the rotating type converter gives exacting frequency for highly technical applications.

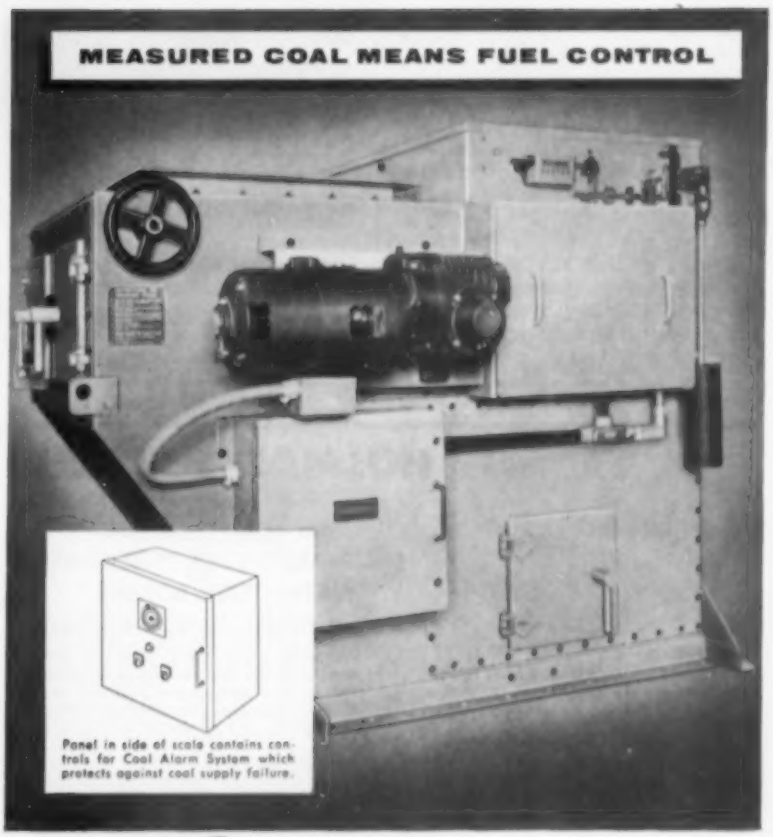
Operation is simple — plug into 115 volt, single phase receptacle on one side of the converter and flip the toggle switch on. Then tap one of the two 230 volt three phase receptacles on the other side of the frame.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 119

Shaft Mounted Drive

K-10 A new higher ratio of 24:1 (or 20:1 in 2 smaller sizes) has been added to the line of all-steel, double reduction, shaft mounted drives, manufactured by **The Falk Corporation,** 3001 West Canal St., Milwaukee 1, Wisc. The outside dimensions and torque rating remain the same.

Practical advantages attributed to the higher ratio units include (1) the use of smaller sheaves to obtain a given output speed, and (2) a saving in motor cost when, because of the lower output speed, a 1750 rpm motor can be used instead of a more expensive slower speed motor. Units available for horizontal and vertical application, in ⅓ to 30 hp ranges, with output speeds as low as 5 rpm.


MEASURED COAL MEANS FUEL CONTROL
Panel in side of scale contains controls for Coal Alarm System which protects against coal supply failure.

Richardson H-39

AUTOMATIC COAL SCALE

saves you money through dependable, efficient, safe operation

Latest in the series of Richardson Automatic Coal Scales, the H-39 is available in two sizes: a 200-pound model with an hourly capacity of up to 20 tons and a 500-pound model with an hourly capacity of up to 40 tons. Here are some of the reasons why it is specified throughout the world by industries that demand outstanding quality and superior operation.

- Large 24" x 24" inlet (standard for all models) so coal moves through freely. Coal never "arches" in an H-39 feeder or weighing hopper.
- All contact platework of stainless steel.
- All parts of scale positively dust-sealed.
- All electrical equipment totally enclosed and installed outside of dust-proof housing, so it is never in contact with coal dust at any time.
- Endless belts available.
- Feeder removable.

For further information, write for bulletin 0352-A.

Richardson

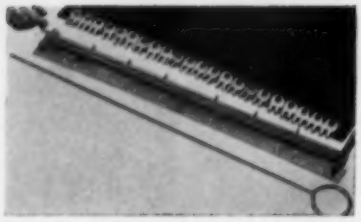
MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY, CLIFTON, NEW JERSEY

Atlanta • Boston • Buffalo • Chicago • Cincinnati • Detroit • Houston • Memphis • Minneapolis
New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal
Toronto • Havana • Mexico City • San Juan • Geneva, Switzerland • Nottingham, England

Aligning Holder for Conveyor Belt Fasteners

K-11 A simple Aligning Holder has been developed by **Flexible Steel Lacing Co.**, Chicago 44, Illinois, which greatly speeds and eases the application of Flexco hinged conveyor belt fasteners.



Advantage are (1) all fasteners are kept in proper alignment while nuts are being run down (2) bolts break off easily and quickly since this aligning holder keeps all fasteners and end of belt rigid (3) hinge pin is easily inserted because all fasteners are assembled in proper alignment (4) a No. 500 Templet is an integral part of the Aligning Holder so that both of these important tools can be had as one complete unit.

The important parts of this holder are the cam pin and the alignment pin which is tapered at one end to enter the fastener loops readily and with a minimum of effort. The two pins hold all the fasteners in proper alignment while the nuts are being tightened.

After nuts are tightened the aligning holder is quickly removed from belt by simply turning cam pin 90° and pulling out alignment pin.

The holder is made in one size for belts up to and including 36" wide.

PACKAGE TYPE HOLMAR WATER TUBE BOILERS

HOLMAR BOILERS

are

Efficient — Safe — Dependable

SHOP-ASSEMBLED "PACKAGE" WATER TUBE BOILERS

GAS - OIL or COMBINATION FIRED

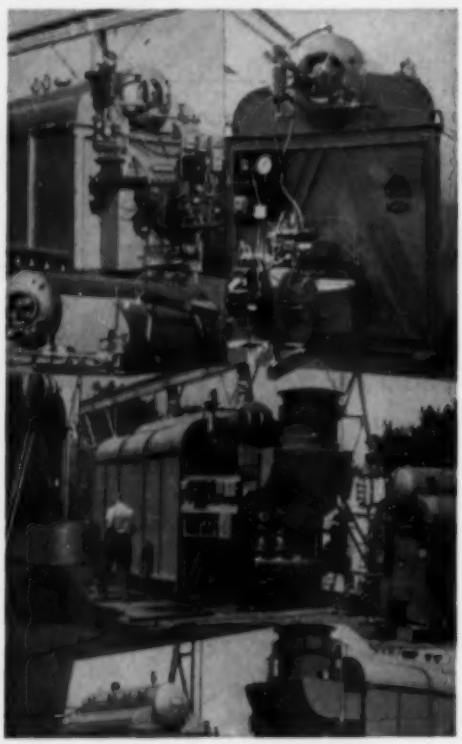
HOLMAR WATER TUBE BOILERS, along with many other allied products made by VULCAN STEEL TANK CORP., are all of the highest quality and long proven design and performance. All are built in full accordance with the latest A.S.M.E. Power Boiler Code and Inspected and Stamped National Board and comply with all State, Municipal and Insurance Company requirements.

HOLMAR

Water Tube Boilers

are now used in such plants as:

Gasoline Plants in Texas and Venezuela, Hospitals, Hotels and Canneries in Hawaii, Pipe Line Stations from the Gulf to New England, Concrete Block Plants in Oklahoma, Idaho and Montana. Laundries from Georgia to California, Cleaning plants from Texas to Michigan and in many Gas Line Pumping Stations, Chemical Plants, Oil Company Laboratories and Oil Field Service, Packing Houses, Radio and T.V. Stations, all doing a creditable job in these and many other installations.



Pressures to 600 Psig.
1,000 to 20,000 lb. Steam per hr.

HOLMAR is the Water Tube Boiler that does a BIG job at LITTLE cost.

BE SAFE — BE SURE — with a HOLMAR WATER TUBE BOILER
Another product of

VULCAN STEEL TANK CORP.

PHONE: MAdison 6-1118 — Box 5292 — TULSA 1, OKLA.
Plant: 3207 Dawson Road

Quality Products for the Petroleum and Chemical Industries Since 1927

"Flush-Cut" Electric Saw

K-12 New electric reciprocating "Flush-Cut" saw by **R. C. S. Tool Corp.**, Box 661, Bloomington, Ill., permits removing quarter round, bolts, rods, pipes, conduit, etc., flush with the surface. Arm accessory is reversible for right or left hand cuts.

Lightweight saw (8 lb) has overall length of 16" and is equipped with ⅓ hp motor. The all-purpose Model 250 electric hack saw delivers 2500 strokes per minute. Metal-cutting blades are color coded indicating the number of teeth per inch.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 119

Repair Kit for Tools and Castings

K-13 **Houghton Laboratories, Inc.**, Olean, New York, are offering Kit No. 6C, a special, easy-to-use repair kit for tools and castings. Based on epoxy resins, the aluminum colored paste will cure at room temperature and is contained in two flexible tubes. Technique insures fast, permanent and economical repair.

New Products (Cont'd)

Lever-Operated Valve

K-14 **Atlas Valve Company**, 280 South Street, Newark 4, N. J., has a redesigned adjustable cam, lever-operated valve for accurate metering control of fuel oil in industrial oil burner installations.

The valve, Atlas Type 235, is designed to control and maintain a certain flow ratio between two variables such as air and fuel oil into an oil-fired steam boiler. It may be used in applications where the flow of two fluids must be kept within specified ratios such as the control of steam for atomizing fuel oil, the control of steam-driven blowers or stokers, or the control of gas-air ratios to burners.

Safety Valves

K-15 A new series of low-cost top guided, semi-nozzle, cast iron safety valves for steam generator service and offering exceptional capacity in the smallest possible valve size has been announced by the **Farris Engineering Corporation**, 630 Commercial Ave., Palisades Park, N. J.

The new Farris 1900 and 2900 Series valves offer a maximum pressure of 250 psig at 450 F, and are ASME approved for Power Boiler and Unfired P. V. codes. A choice of 21 nozzle sizes and seven body sizes from 1½F2 to 6S8 eliminates over-sizing on boilers, thus preventing draining of water from the boiler.

YOU GET more* WHEN YOU BUY BEARINGS FROM YOUR Bunting® DISTRIBUTOR

*more precision

QUICK, EASY ASSEMBLING, perfect functioning and trouble-free maintenance are assured by Bunting's precision. Precision requirements in the manufacturing of Bronze Bearings and Bars go far beyond mere dimensional accuracy. There is precision in the metallic composition and in every factory operation required to produce Bunting Cast Bronze and Bunting Sintered Powdered Oil-filled Bronze Stock Bearings and Bars. Precision in the handling of the customers requirements is the common characteristic of Bunting distributors whose ample stocks of these products are always at your command.

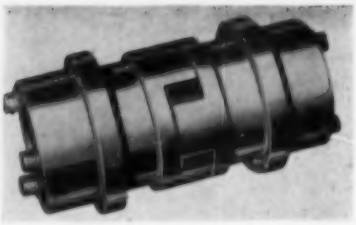
Your Bunting distributor is listed in the classified section of your telephone directory usually under Bars—Bronze, and Bearings—Bronze. Two modern Bunting factories and eleven Bunting Branch Warehouses expedite distribution in all areas. Write, or ask for catalogs giving complete dimensional listings and technical data.

All Bunting Sintered Bronze Plain and Flange bearings stamped with part number—an exclusive Bunting feature.

Bunting | BUSHINGS, BEARINGS, BARS AND SPECIAL PARTS OF CAST BRONZE AND POWDERED METAL.

The Bunting Brass and Bronze Company • Toledo 1, Ohio • Branches in Principal Cities

Radially Removable Flexible Coupling



K-16 A radially removable flexible coupling which provides a simple means of disconnecting two units without axial movement of the shafts has been developed by the **Lovejoy Flexible Coupling Company,** 4899 W. Lake St., Chicago 44, Ill.

Known as the Type RRL, this coupling simplifies maintenance and is ideal for applications where driven equipment such as a pump must be disconnected while the driving unit continues to operate. All that is necessary in such cases is to disassemble the coupling itself.

Completely maintenance and lubrication free, the RRL coupling is extremely rugged and simple in design. There is no wear on the metal jaws since the load is transmitted by compression of the one-piece load cushion.

Horsepower ratings range from 7.5 to 40 at 1800 rpm. Maximum bores range from 1⅝" to 2¼" with maximum O.D.'s from 2 9/16" to 5". Maximum overall length runs from 6⅛" to 7⅝".

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 119

FLAME RETENTION

COMBUSTION EQUIPMENT

ENGINEERED BY THE WEBSTER ENGINEERING COMPANY

COMBUSTION with SAFETY

Unparalled safety is but one of the features of WEBSTER'S revolutionary non-premixing ring gas burner incorporating flame retention regardless of air velocity.

Factory assembled Forced Draft Series H packaged units are available for Gas, Rotary Oil or Combination. Other variations soon to be available.

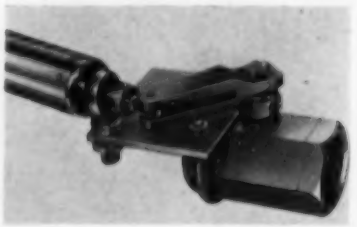
Some Territories Open

Write for Series B13 literature.

The **WEBSTER ENGINEERING** *Company*

TULSA 16, OKLAHOMA

Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio



Ball Valves Remotely Controlled

K-17 A line of air or hydraulic operators has been announced by **Jamesbury Corporation,** 45 New Street, Worcester, Mass. for their standard line of "Double Seal" ball valves (¼" to 4").

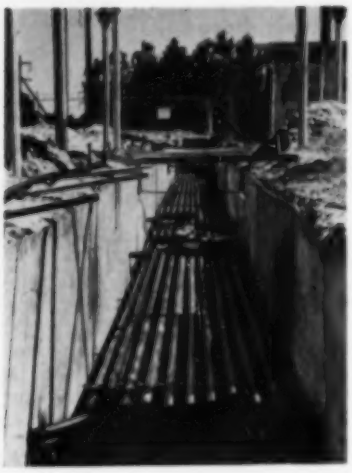
Advantage is that these operators permit manual operation of the valves in case of power failure. Operators can be disconnected without special tools. Speeds range from ⅛ second for a ¼" valve to ¾ second for 1¼" to 4" valves. Speeds can be increased or decreased. Continuous duty up to 100 cycles per minute.

Easy Joining Conduit

K-18 Carlon D. Conduit, designed to save installation time, stop moisture damage and last permanently, is available from **Carlon Products Corp.,** 10225 Meech Ave., Cleveland 5, Ohio.

Ten foot lengths of the new plastic conduit go together fast with moisture and root proof solvent weld joints. To join two lengths of "D" conduit, it is only necessary to brush Carlon "D" solvent cement on the outside ends of the pipe and inside the couplings — then push together. In minutes the cement is set, resulting in a permanent weld.

No special tools are needed to



install "D" conduit, it cuts with a hand saw. One man can install 100 ft of "D" in forty minutes. This new conduit having a rubber and styrene base will not absorb water even after many years use and resists traffic shock.

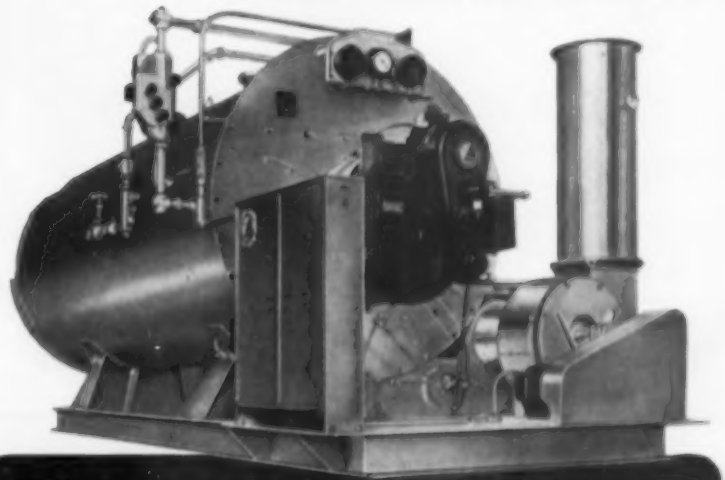
Industrial Skin Cleanser

K-19 Vi-Lan, a waterless skin cleanser available from **Dameron Enterprises, Inc.,** 427 So. 20th St., Louisville 3, Ky., is a heavy-duty paste-cream antiseptic cleanser fortified with Actamer, a product of the Monsanto Chemical Co. which reduces skin bacteria as much as 97%.

The non-alkaline, non-acid, all-purpose cleaner removes greases, oils, paints, tars, pipe dope, gasket cement, etc., and is an effective guard against dermatitis and other skin irritations. It can be properly dispensed with portable and stationary dispensers conveniently placed on work benches, service trucks, work carts, lavatories and in every wash room.

SAFEST—
MOST EFFICIENT

Preferred
UNIT STEAM
GENERATOR



Where gas is the fuel—
INDUCED DRAFT is a MUST
for healthful operation

The Preferred Units operate under a negative pressure, with the Induced Draft Fan *completely* purging the *entire* pressure vessel of any stray raw gases before and after firing.

During combustion there is no possibility of noxious fumes entering the boiler room or surrounding areas.

Other significant differences in Preferred design are

1—The only Unit with a tube sheet protective device.

2—The only Unit with a precipitator for cleaner operation.

3—Substantially lower off-period losses.

4—Up to 95 per cent greater steam storage for smoother operation and faster response to steam demand.

5—Up to 65 per cent greater evaporation area for drier steam.

6—As much as 50 per cent saving in electrical consumption.

7—Heavier material and more rugged construction.

8—The highest available guaranteed thermal efficiency of either fire tube or water tube "package" boiler design.

Preferred Unit Steam Generators, though higher in initial cost, return substantial dividends in overall savings year after year after year for 25 years and more.

Write for "tell-all" Bulletin 2000.

PREFERRED UTILITIES MFG. CORP.
1860 BROADWAY Dept. SP NEW YORK 23, N. Y.

EXTRA YEARS

OF MORE DEPENDABLE POWER
and at less cost per pound of steam

TODD BURNERS

GAS OR OIL

PRODUCTS DIVISION

TODD SHIPYARDS CORPORATION

HEADQUARTERS:
Columbia & Halleck Streets, Brooklyn 31, N. Y.

PLANT:
Green's Bayou, Houston 15, Texas

TODD
NEW YORK TEXAS

Your New Sealing Problem May be an Old One to Us . . .

FREE ENGINEERING COUNSEL . . .
We invite you to submit details on your sealing needs.

FOR 40 YEARS Durametallic has built up an extensive Service Record File. It covers answers to hundreds of specific sealing problems. In all probability we have the answer to your sealing problem in this "success" file.

DURAMETALLIC CORPORATION
KALAMAZOO MICHIGAN

New Products (Cont'd)

Mercury Vapor Lamps

K-20 The addition of four new types to its mercury vapor lamp line has been announced by the Lighting Division, **Sylvania Electric Products Inc.**, 1740 Broadway, New York 19, N. Y.

Two of the types are 1000-watt color-improved lamps, while two are in the 425-watt line.

The 1000-watt lamps are semi-reflector types, and with these lamps many existing installations using 1000 watt lamps may obtain more light by installing the Sylvania D-H15 or D-H12 in place of the existing lamp. New installations may use fewer fixtures.

The 425-watt A-H17 and A-H18 mercury vapor lamps are expressly designed for use in the popular 277/480 volt systems and thereby take advantage of the economies of this system.

Corrosion Inhibitor for Cooling Tower Systems

K-21 By carefully combining several effective corrosion inhibitors, **National Aluminate Corporation**, 6216 W. 66th Place, Chicago 38, Ill., has developed a new water treatment formula — Nalco 360 — for control of corrosion in cooling tower systems.

Nalco 360 is basically a chromate type material to which other inhibitors, each of which exerts a synergistic effect on the others, have been added. The resulting combination is said to provide much better corrosion control than any of the several inhibitors used alone. The new product is effective over a relatively wide range of pH conditions, thus control of pH of the cooling water is easier and much less exacting than is required with many corrosion control treatments.

Nalco is produced in the form of three inch diameter ball briquettes, weighing approximately one pound each. To apply the chemical a simple bypass feeder is normally used. Cooling water passing through the feeder dissolves the ball briquettes and carries the solution of chemical treatment back into the cooling water line. In other cases the chemical briquettes are merely dissolved in a wire basket suspended in the cooling tower basin.

Explosive Gas Determination

K-22 The Probetector, a portable measurement instrument which determines accumulations of explosive gases, is available from **Atlas Laboratories,** 1911 W. Alabama, Houston, Texas.

Model 504 is designed for use in any industry where there is a possibility for accumulation of explosive gases. It is factory calibrated for methane and ethane gases, but may be obtained with calibrations for other gases. Actual percentages for specific gases are shown by calibration curves. Unit operates on a two-volt storage battery. Battery charger is provided with each unit.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 119

Free Piston Engine Lubricant

K-23 A new lubricant has been developed by the **Shell Oil Company,** 50 West 50th St., New York 20, N. Y., expressly for trouble-free cylinder lubrication of free piston gas generators.

The new oil — "Free Piston Engine Oil" — is reported to minimize ring and cylinder liner scuffing and scoring, rapid ring wear, deposit formation in engine case and upon compressor delivery valves.

Free piston gas engines, now being produced in Europe and in the United States, attain the high thermal efficiency of the diesel cycle with the simplicity of turbine shaft output. Result is an increase in overall economies and a decrease of maintenance costs. Shell emphasizes that in the past a lack of a suitable cylinder lubricant has caused excessive engine wear.

SEASONED EXPERIENCE AND EXPANDED FACILITIES

... Try Bird-Archer Water Treatment Service

This is a corner of Bird-Archer's new laboratory in Philadelphia where speed and capacity to run tests of water samples has been doubled. Additional facilities and field personnel extend the benefits of Bird-Archer's popular 8-Point Water Treatment Service over a greater area than ever before. This program includes services helpful to you if you are not already a Bird-Archer client.

8 POINT WATER TREATMENT SERVICE for Power, Process and Cooling

1. Study of Water Availability and Supply
2. Survey of Plant and Process
3. Scientific Laboratory Analysis of Samples
4. Development of Treatment and Control System
5. Custom Formulation of Chemicals
6. Recommendations and Specifications for Equipment
7. Instruction of Plant Staff in System Application
8. Periodic Check-Ups by Field Service Engineers.

60 years' reputation for the highest quality chemicals and sound engineering in water treatment are your insurance in your investment in Bird-Archer service. Let a Bird-Archer man "trouble-shoot" your problems in water and steam control. Write for a copy of our free book, "Industrial Water Treatment" and the name of our nearest representative.

BA601

SEND FOR THIS CATALOG ALSO

BIRD-ARCHER
WATER TREATING ENGINEERS
THE BIRD-ARCHER COMPANY, 4337 N. AMERICAN ST., PHILADELPHIA 40, PA.
New York, Chicago
The Bird-Archer Co. of California, 881 Mission St., San Francisco
Offices also in Canada and Mexico

High Visibility

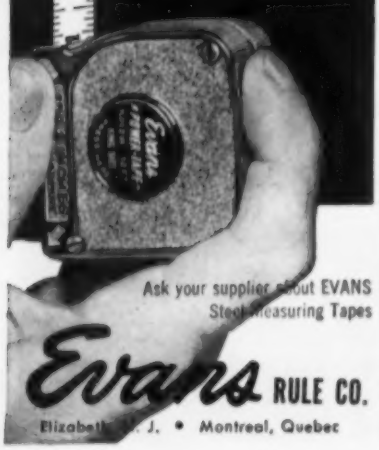
EVANS

STEEL MEASURING TAPES

MEAN GREATER ON-THE-JOB SPEED AND ACCURACY

Evans flexible steel measuring tapes shave seconds from every measuring job. Jet black markings on snowy white background give exact readings at a glance. Big, easy-to-see numerals show both inches, and feet-and-inches. There's an Evans tape in every size and shape . . . at prices that mean economy. Best of all, Evans blades are replaceable quickly, easily.

Tapes may be supplied with your company name plate, if desired, to give to your customers as a wonderful good-will builder!



Ask your supplier about EVANS Steel Measuring Tapes

Evans RULE CO.

Elizabeth, N. J. • Montreal, Quebec

New Products (Cont'd)

5000 psi Throttling Valve With Low Turning Torque

K-24 An accurate throttling valve of simple construction, designed for pressures up to 5000 psi, is being built by **Republic Manufacturing Company**, 15655 Brookpark Rd., Cleveland 11, Ohio, in the 1" (-16) size, under the name Throttle-Flo. The operator adjusts only a small needle valve to obtain proper flow.

Needle valves are not desirable for pressures of 3000 psi and higher because of restricted flow, high pressure drop, and high handle turning torque. This new Throttle-Flo valve overcomes these disadvantages by means of pilot needle valve control of a large dynamically balanced piston. All flow regulation is through the pilot valve, which can be turned with the finger tips because of the small area under pressure and the large fine-pitch thread. Full flow is obtained by only two and a half turns of the pilot valve, yet metering is accurate to 1/100 of a gallon per minute through the entire range of the valve. A positive seal is maintained under the most critical conditions.

Dual Action Electric Drill

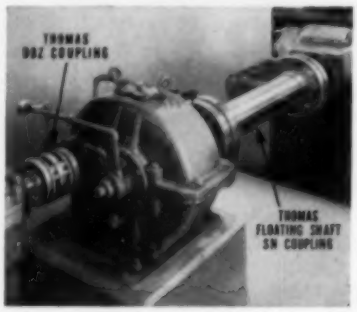
K-25 A selection action ¾" electric drill, which combines both pneumatic type impact action for carbide masonry drilling plus regular action, has been developed by **Power Tools Corp.**, 1421 Lakeside Ave., Cleveland 14, Ohio.

The Uni-Drill, rated at 3 amps industrial for continuous service, will take up to 1" carbide masonry drill bits. Drill speed is 2500 rpm; 1700 rpm under load. Since unit weighs less than 6 lb, it is handy to use for scaffold and overhead work. Selector control on top of drill turns to release an internal impact cam, allowing it to float for conventional drill action in wood, steel, and similar materials.

THOMAS

FLEXIBLE COUPLINGS

Give You Freedom From Coupling Maintenance



NO LUBRICATION

NO MAINTENANCE

NO WEARING PARTS

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.

They will protect your equipment and extend the life of your machines.

Properly installed and operated within rated conditions, Thomas Flexible Couplings should last a lifetime.

UNDER LOAD and MISALIGNMENT ONLY THOMAS FLEXIBLE COUPLINGS OFFER ALL THESE ADVANTAGES.

1 Freedom from Backlash Torsional Rigidity
2 Free End Float
3 Smooth Continuous Drive with Constant Rotational Velocity
4 Visual Inspection While in Operation
5 Original Balance for Life
6 No Lubrication
7 No Wearing Parts
8 No Maintenance

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING CO.

WARREN, PENNSYLVANIA, U.S.A.

Sump Pumps

K-26 A new line (Type EUN) of completely redesigned non-clog sump pumps is available from the **C. H. Wheeler Mfg. Co.**, 19th & Lehigh Ave., Philadelphia, Pa., for drainage, sewage disposal, and industrial service.

The new pumps are available in 3 and 4" sizes; capacities from 20 to 1100 gpm; heads to 160 ft.

Easier servicing is afforded by a split motor stand, allowing access to motor, pump shaft and bearings. After removing only four bolts, motor can be lifted off the pump without disturbing piping. Self-lubricated bearings are used to eliminate lubrication problems.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 119

Distribution Transformers

K-27 Full current protection for ratings from 10 to 100 kva is provided by type FCP and full current protection plus surge protection is provided by type FSP distribution transformers being produced by **Federal Pacific Electric Co.**, 5815 Third St., San Francisco 24, Calif.

Both types incorporate internal circuit breakers, internally mounted primary fuses, warning signal lamp and emergency overload device.

Circuit breakers are mounted directly above core and coils, submerged in oil. They are tripped by bimetal elements which are sensitive to transformer winding temperature. Breakers are series-connected in the low voltage winding.

As maximum safe transformer load is approached, temperature rise deflects the bimetal and connects a red warning lamp. If load and temperature continue to rise, further deflection trips the breaker and disconnects the secondary load.

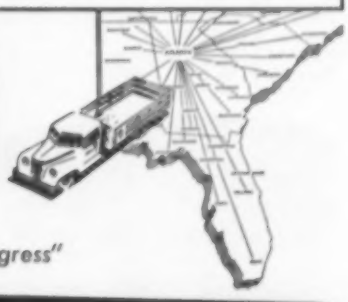
Service can be restored while the transformer is hot by movement of an emergency overload lever which is conveniently located below the warning lamp. When the lever is moved to maximum position, warning lamp and breaker settings are advanced to permit nominal overloading. Movement of the lever to reset and reclosing position disconnects the warning lamp and closes the breaker. Excessive overload condition will automatically recycle the protective devices when the lever is held in "on" position.

In the photo above, made in the loading dock of our Warehouse Division, you'll see written in chalk on the lift "Go man, go!" It was put there by one of the workers. We think it typifies the spirit that moves steel and aluminum so rapidly from our warehouse to you.

The minute your order hits our order desk, it's on the way to being filled. Usually delivery is made anywhere in the Southeast within 24 hours—by our own fast fleet of trucks or by reliable common carriers.

With service like this—and ample stocks of a wide range of steel and aluminum warehouse products—no wonder it will pay you to call—

TRinity 5-3441
24 to 48 HOUR DELIVERY
ANYWHERE IN THE SOUTH

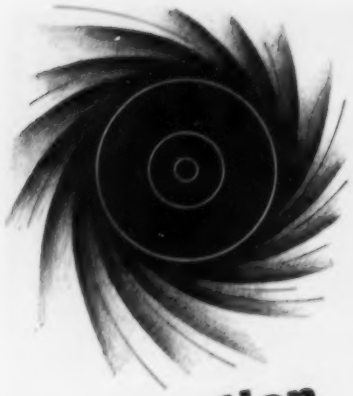


"Service in Step with Southern Progress"

AMERICAN STEEL WAREHOUSE ASSOCIATION — BETTER DISTRIBUTION

WAREHOUSE DIVISION
Atlantic Steel Company

14th at Northside Drive, P. O. Box 1714, Atlanta 1, Georgia



lubrication at high speeds

These LUBRIPLATE Lubricants provide the all-necessary lubrication for those modern, high speed machines operating up to 30,000 revolutions per minute.

LUBRIPLATE
No. 205—A superior and protective lubricant for anti-friction and plain sleeve grease type bearings, operating at speeds in excess of 5000 R.P.M. Widely used for lubrication of high speed bearings on woodworking machines, textile spindles, grinder arbors, etc.

LUBRIPLATE
Nos. 0, 1 and 2 are highly specialized light fluid type lubricants with high film strength. Their characteristics are excellent at both low and elevated temperatures. May be applied by conventional means.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

New Products (Cont'd)

Oscillograph

K-28 A new model of the Hathaway S-25 oscillograph — the S-25C — is now available from the **Hathaway Instrument Division**, Hamilton Watch Company, 5800 East Jewell Ave., Denver 22, Colorado.

It is a multi-element, all-purpose oscillograph especially designed for unlimited applications, greatest convenience of operations and finest quality of recordings. A new feature is cartridge loading of the record magazine, which can be done much more quickly than loading rolls of paper.

Other S-25C features include 12-in. wide recording paper, capable of recording 18 channels with the Hathaway OA-2 and OA-3 galvanometers, and up to 48 channels with the Hathaway OV galvanometers. The S-25A and B models accommodate up to 36 OV galvanometers or 14 OA-3 or OE-3 galvanometers.

In common with its sister models, the S-25C oscillograph has a number of exclusive features including automatic replacement of lamps upon burnout, instantaneous pushbutton chart speed selection while operating, automatic trace density control, continuous monitoring of reserve chart supply, automatic record numbering, automatic record length control, and automatic selection of time line intervals. A remote control feature is made possible by removing the S-25 panel for mounting in an accessory box complete with cable.

Soluble Cutting Oil for Heavy Duty Service

K-29 A new emulsified cutting oil which substantially increases the efficiency of many heavy-duty machining and grinding operations has been announced by **Gulf Oil Corporation.**

Catawissa PERFECT SEAL Unions

HOT FORGED from solid, rectangular steel bars, designed and produced for dependable, long-life service under the severest piping conditions!

A TYPE FOR EVERY USE!
FOR ALL PRESSURES!
FOR ALL TEMPERATURES!

Standard & Double Extra Heavy UNIONS
Available with screwed or socket weld ends. 3000-lb. sizes ⅛" to 3"; 6000-lb. sizes ⅛" to 2".

ORIFICE UNIONS
With screwed or socket weld ends. 3000-lb. and 6000-lb. service.

MALE & FEMALE UNIONS
With steel-to-steel, bronze-to-steel, stainless steel-to-steel or orifice seats. 3000-lb. service only.

FULL STAINLESS & FULL ALLOY STEEL UNIONS
With screwed or socket weld ends. 3000-lb. and 8000-lb. service.

WRITE FOR CATALOG 56
Showing the Complete Catawissa line of Perfect Seal Products
CATAWISSA VALVE & FITTINGS COMPANY
950 MILL ST., CATAWISSA, PA.

Gulf Building, Pittsburgh, Penna.

The new oil is Gulfcut Heavy Duty Soluble Oil, which effectively combines the cooling ability of water with the lubricity and protection of oil. This new product makes possible lower machining costs through longer tool life, heavier cuts, and higher speeds and feeds. These user benefits apply to all metals, particularly those with low machinability ratings.

Chemically - active compounds protect against foaming and welding. Wetting-out properties are high, providing more effective cooling. Other benefits of this new soluble cutting oil, which contains a stable petro - chemical emulsifier, include superior surface finish as well as greater protection from rust and corrosion.

In grinding operations, in particular, Gulfcut Heavy Duty Soluable Oil gives exceptional results, with good finishes and minimum wheel loading and breakdown.

Applications include: Heavy hogging cuts, fast fine cuts, boring and grinding of ferrous and nonferrous metals and alloys, including tough titanium alloys.

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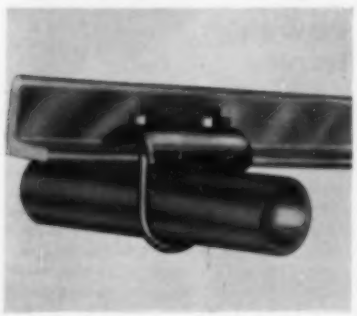
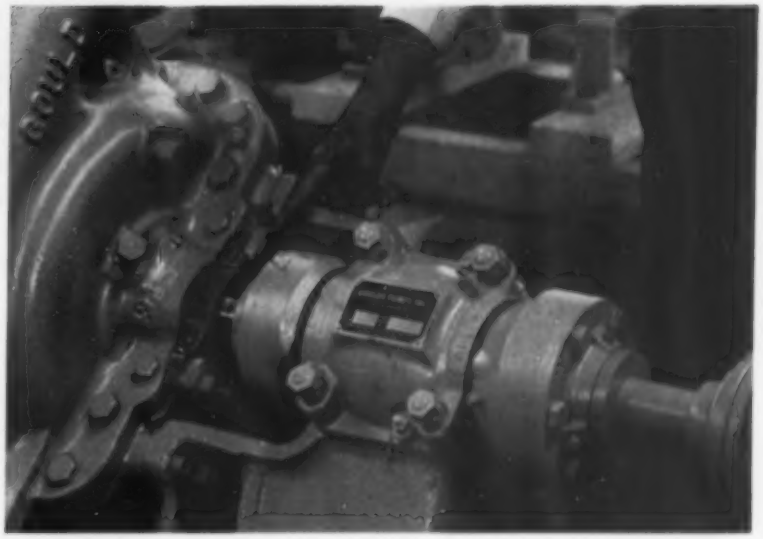


Right Angle Conduit Hanger

K-30

A new Ramco Type X right angle conduit pipe hanger designed by **Ramco Manufacturing Company**, 540 Westfield Ave., W. Roselle Park, N. J., is designed to retain constant effective clamping tension by the spring action designed into the saddle. Sharp biting edges at the corners of the saddle are further apart than the U-bolt legs, thereby providing self-equalizing bite pressure and unusual stability.

The Type X right angle hanger, available in ⅜" to 2" pipe size can be used with standard pipe or rigid steel conduit for mounting on structural flanges up to ⅞" thick.



Pump maintenance more important than ever.

Today good pumps are made of materials suited to their jobs. Many, with fluid ends of new, longer-lived alloys, are built to resist corrosion and abrasion longer—much longer. They probably represent more investment per pump. But they'll pay off. All they need is better mechanical attention to match their longer life.

Good way to keep your pumps running longer.

Use a set of these Goulds Pump Maintenance Record Cards. They make it easy for you to set up regular lubrication-inspection schedules; help you plan pump repairs during normal plant shutdowns; give you an accurate "history" on each pump, as a guide to the best materials of construction for your pumping conditions.

Get your Pump Maintenance Record Cards, free, from your Goulds representative, or write direct.

GOULDS

PUMPS FOR INDUSTRY

GOULDS PUMPS, INC.
Seneca Falls, N. Y., Main Office and Works
BRANCHES
ATLANTA, 15 Peachtree Place, N.W.
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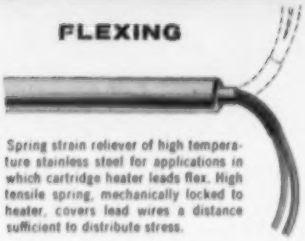
HOUSTON, 2314 Main Street
NEW YORK CITY, Room 1503, 11 Park Place
PHILADELPHIA, 2099 North 63rd Street
PITTSBURGH, Room 512,
Bessemer Bldg., 104—6th Street
TULSA, 543 East Apache Street,
P. O. Box 6157

West Coast Representative: GOULDS PUMPS Western, Inc., 1919 N.W. Thurman St., Portland 9, Oregon
In Canada: The A. R. Williams Machinery Co., Ltd. . . . in all principal cities

TAKE YOUR PICK!

Special Chromalox features solve 3 spot heating problems

FLEXING



Spring strain reliever of high temperature stainless steel for applications in which cartridge heater leads flex. High tensile spring, mechanically locked to heater, covers lead wires a distance sufficient to distribute stress.

MOISTURE

Moisture-resistant flexible brass conduit protects lead wires of cartridge heaters operating in presence of steam, water, oil and vapors. Also offers added protection from flexing, vibration and mechanical damage.

ABRASION

Flexible brass conduit protects cartridge heater lead wires against abrasion from other moving parts and from accidental mechanical damage. Safety factor where lead wires are exposed to machine operator.

FREE BULLETIN!

CHROMALOX ELECTRIC CARTRIDGE HEATERS

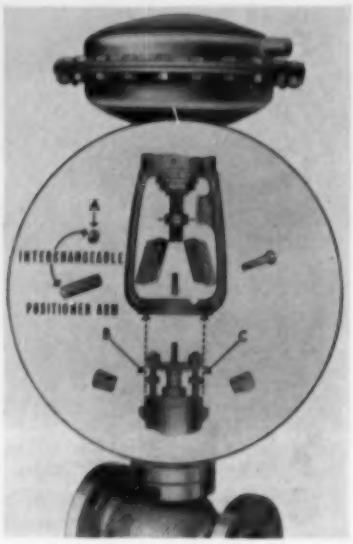
Get the full story. Call your Chromalox Representative or write today for Bulletin 850.

C-2181

Edwin L. Wiegand Company

7563 Thomas Boulevard • Pittsburgh 8, Pa.

New Products (Cont'd)



Pneumatic Actuators for Diaphragm Control Valves

K-31

Completely redesigned diaphragm control valve pneumatic actuators are being produced by **Hammel-Dahl Co.**, Warwick Industrial Park, Providence 5, R. I.

Feature of the design is the new split-coupling which joins the actuator spring stem to the valve plug stem. The stems do not engage — do not meet. Simply by loosening nuts "A," "B," and "C," the actuator may be lifted over the plug stem. The slotted holding clips, the clearance denoted by the dotted lines and arrows, and the coupling arrangement, allow the actuator to be completely removed without disturbing the packing box bolting.

The coupling has L.H. (upper) and R.H. (lower) threads, and in addition to being a twist-proof clamp for joining the stems, it acts as a turnbuckle for the adjustment of plug seating tension.

No valve disassembly is required when positioner is mounted in the field. Every valve is equipped with a universal bracket for the mounting of any positioner. Nut "A" is removed and the appropriate positioner arm threads to the same coupling screw.

The new actuators are available in three standard sizes, with each size covering twelve different constructions. Three spring ranges — 3 - 15, 5 - 25, and 6 - 30 PSI — are completely interchangeable in each size and type of actuator.

THE RIGHT ANSWER

for greater productivity from machinery investments

Sterling ELECTRIC POWER DRIVES

The important distinguishing features of Sterling Electric Power Drives can bring greater productivity and cost reductions to your manufacturing operations. To help you meet the competitive challenge of mechanization and automation, Sterling offers power transmission equipment, variable speed or constant speed—manual or automatic controls—and an application engineering service. Together, these give your machinery the type of drive systems that will achieve maximum productivity at lowest cost.

Sterling Speed-Trol Variable Speed Motors
Sterling Slo-Speed Gear Motors
Sterling Constant Normal Speed Motors
Sterling Multi-Mount Speed Reducers

Write today for Bulletin No. 185. Discover the big advantages Sterling Electric Power Drives can bring to your plant.

Sm

STERLING ELECTRIC MOTORS

LOS ANGELES 22 • CHICAGO 35
CINCINNATI 37 • NEW YORK 51

Spare the Chisel · Save the Parts USE KROIL

Don't ruin a valuable piece of equipment merely because some part is rusted tight. Apply Kroil, the amazing new chemical lubricant that creeps into millionth inch spaces (proved by laboratory tests), dissolves rust, supplies necessary lubrication and

LOOSENS FROZEN PARTS

18,000 of America's leading plants can't be wrong! They have used KROIL for 10 years and are still depending on it to save expensive labor and valuable parts. They say: "Kroil loosened bushings after a 12-ton press had failed" . . . "on repairing heat treat trolleys formerly destroyed every nut. Now Kroil saves them all, and time, too" . . .

You too should be using KROIL every day. Try it on money-back basis. Gallon $4.00; with Kroiler trigger squirt gun (shoots a drop or a stream 15 feet, if desired) $4.95, f. o. b. our factory.

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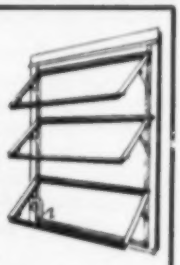

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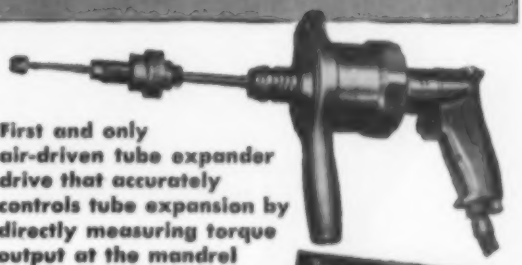
For Expanding Heat Exchanger Tubes

NEW WILSON Torq-Air-Matic



First and only air-driven tube expander drive that accurately controls tube expansion by directly measuring torque output at the mandrel

Only the Wilson Torq-Air-Matic offers all these features: air driven, automatic trip-off, completely integrated, non-electrical, non-frictional, calibrated in ft lbs torque, lightweight, simply adjusted.

Send for your copy of Wilson Bulletin 55.

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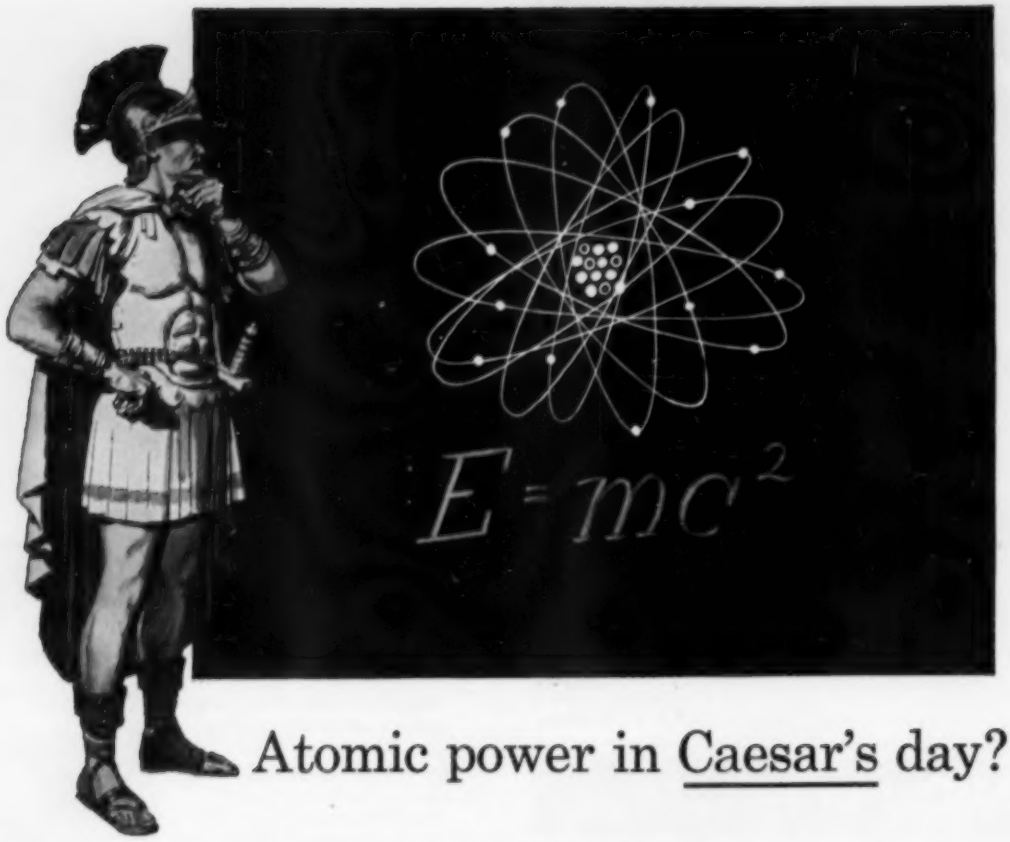

Atomic power in Caesar's day?

Certainly!

It was there, in the ground, in the air and water. It always had been. There are no more "raw materials" today than there were when Rome ruled the world.

The only thing new is knowledge . . . knowledge of how to get at and rearrange raw materials. Every invention of modern times was "available" to Rameses, Caesar, Charlemagne.

In this sense, then, we have available *today* in existing raw materials the inventions that can make our lives longer, happier, and inconceivably easier. We need only *knowledge* to bring them into reality.

Could there possibly be a better argument for the strengthening of our *sources* of knowledge—our colleges and universities? Can we possibly deny that the welfare, progress—indeed the very *fate*—of our nation depends on the quality of knowledge generated and transmitted by these institutions of higher learning?

It is almost unbelievable that a society such as ours, which has profited so vastly from an accelerated accumulation of knowledge, should allow anything to threaten the wellsprings of our learning.

Yet this is the case

The crisis that confronts our colleges today threatens to weaken seriously their ability to produce the kind of graduates who can assimilate and carry forward our rich heritage of learning.

The crisis is composed of several elements: a salary scale that is driving away from teaching the kind of mind *most qualified* to teach; overcrowded classrooms; and a mounting pressure for enrollment that will *double* by 1967.

In a very real sense our personal and national progress depends on our colleges. They *must* have our aid.

Help the colleges or universities of your choice. Help them plan for stronger faculties and expansion. The returns will be greater than you think.

If you want to know what the college crisis means to you, write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, New York.

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"Joe, you wouldn't buy the engine of your car from one manufacturer, the wheels from another and the body from still another, would you? Neither would I. And when I design for induced draft, I specify a P-D Stack because the I.D. Fan, though it is important, isn't the whole story. The combined breeching, stack and fan, built as ONE apparatus, gives me unit responsibility, compact design, simplified engineering, and positive performance, with a lot less purchasing details.

"Another thing, I'd rather buy my Dust Collector from the same manufacturer that made my Stack and Fan. For this is all part of the same, system for handling the gas after it leaves my boiler unit.

"There's nothing like putting all the responsibility on ONE manufacturer's shoulders if you can, for then you'll come out on the long end nine times out of ten. Buying such equipment piece-meal is antiquated and costly."

You can save a lot of time, trouble and money by purchasing your Stack and Dust Collector from Prat-Daniel.

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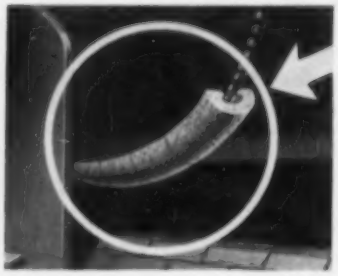

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No one can predict when the girth seam of a riveted HRT boiler will start leaking due to buckling of the outer lap. It's better to insulate the seam before the damage occurs, thus avoiding expense and hazard.

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National Boiler Protector Co.
928 Reibold Bldg., Dayton 2, Ohio

New Product Briefs (Continued)

New Connectors Take Copper & Aluminum Conductors

K-34 For the first time compression connectors for use on both aluminum and copper conductor are available. The new line of connectors, developed by **The Thomas & Betts Company,** 36 Butler Street, Elizabeth, New Jersey, may be used to splice the different type conductors without electrolytic action. Making it unnecessary to stock both copper and aluminum connectors, the new versatile connectors reduce inventory requirements. Proper installation of the connectors is faster and surer through a color-keyed system.

Made of high conductivity aluminum, the new connectors have a new hot-tin coating to prevent electrolysis and eventual joint failure.

The new line consists of one-and-two-hole lugs and two-way connectors from No. 8 AWG to 1,000 MCM. Each connector size from No. 8 to 3/0 is color-keyed to a die in the new TBM 5 hand tool. Correct choice of an installation die for a connector is quickly made by matching their colors. Connector sizes from 4/0 to 1,000 MCM are installed with a hydraulic tool. These connectors are also color-keyed to hex dies used in the hydraulic tools.

Hammerless Setting Tool

K-35 For easy, secure installation of small and medium size machine screw anchors in tile, concrete and cinder block and all types of masonry, the **Arro Expansion Bolt Company,** Boone Ave., Marion, Ohio is offering the "Arro" Expander Hammerless Setting Tool, available to fit small anchors up to and including the ¼" diameter.

Operation is simple — screw the anchor onto the threaded stud, insert into the hole to the proper depth, then turn the "T" handle until anchor is fully expanded.

KEEP UP-TO-DATE

See Service Cards

Pages 119-120

Vibration Monitor System

K-36 A new non-electric vibration monitor system that is sensitive to increases in vibration yet ignores both starting vibration and transient shocks normal to operation, has been developed by the **Fielden Instrument Division of Robertshaw-Fulton Controls Co.,** 2920 N. Fourth St., Philadelphia 33, Pa.

The system combines the Robertshaw model 65 malfunction detector, for mounting on the protected equipment, and the new model 651 A. C. control unit which is wired to the detector.

The model 65 is designed for use in Class I, Group D; and Class II, Groups F and G locations. The control unit is oil-tight and is installed in a non-hazardous location unless connected with an air line using an optional air purge fitting.

Applications include the protection of pumps, motors, blowers, compressors, centrifuges, engines, turbines and other costly equipment. The model 651 control unit is available for operation with 115, 230 or 460 V.A.C. control circuits. Models are also available for use in D. C. circuits.

In operation the model 65 malfunction detector trips whenever the vibration exceeds the preset vibration level. The model 651 control unit must reset the detector in rapid sequence several times before the shutdown time delay relay, selected for a 2 or 5 second delay, will actuate. The unit is held inoperative for a selected time of up to 120 seconds after starting to allow the protected equipment to reach full speed.

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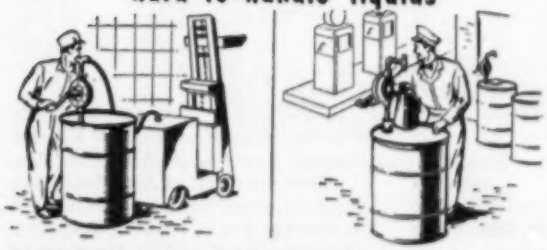
"For transferring, for dispensing hard-to-handle liquids



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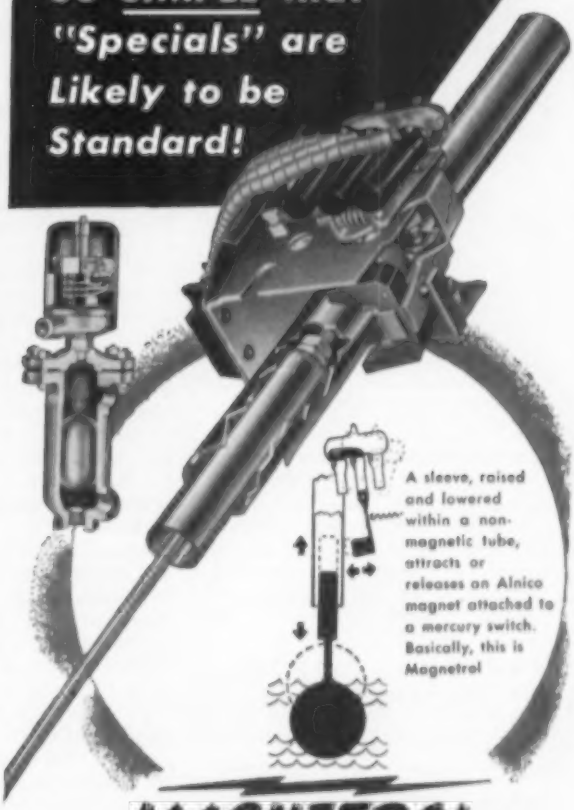
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New Plants & Expansions

South Atlantic

Underway is first phase of $450,000 water and sewer improvement project for **Plant City, Fla.** . . . **Tampa Electric Co.** erecting $200,000 operations center on 11 acre tract in **Plant City, Fla.** . . . $2,000,000 electric steel rolling mill underway for **Florida Electric Steel Mill Corp.** in **Tampa, Fla.**

Albany Limestone Co. expanding its strip-mining and processing operations in **Albany, Ga.** at a cost of $300,000 . . . $750,000 plant addition in **Columbus, Ga.** being planned for **Nehi Corp.** . . . **Dodson Stone Works** constructing $100,000 plant in **Jackson, Ga.** . . . $1,717,000 sewage disposal system getting underway for **Macon, Ga.** . . . Pipe coatings processing plant underway in **Norcross, Ga.** for **Southeastern Pipe Coating Co.** at a cost of $100,000 . . . **Anaconda Wire & Cable Co.** has purchased 175 acre tract in **Watkinsville, Ga.** for construction of wire-cable products plant.

Early 1958 completion anticipated for 100,000 sq ft plant for **Diecraft, Inc.** in **Sparks, Md.** . . . **Esso Standard Oil Co.** to erect 21,600 sq ft electronic data-processing center in **Towson, Md.**

$5,000,000 addition to nylon facilities in **Asheville, N. C.** underway for **American Enka Corp.** . . . $100,000 addition planned for **Standard Chemical Co.** in **Charlotte, N. C.** . . . Mid-1958 completion scheduled for **Westinghouse Electric Corp.'s** 24,000 sq ft manufacturing and repair plant in **Charlotte, N. C.** . . . **American Bitumuls & Asphalt Co.** to spend several hundred thousand dollars on asphalt terminal in **Wilmington, N. C.** . . . Multi - million dollar expansion planned for **R. J. Reynolds Tobacco Co.** in **Winston-Salem, N. C.**

$300,000 building to be erected in the fall for **Aiken Electric Co-operative** in **Aiken, S. C.** . . . Nearing completion is 150,000 sq ft plant in **Bennettsville, S. C.** for **Oak River Mills.**

Dan River Mills to construct 50,000 sq ft research and chemical manufacturing plant on 13 acre site in **Danville, Va.** . . . A second dam has been proposed for **Appalachian Electric Power Co.'s** Smith Mountain hydroelectric development in **Leesville, Va.**

$8,000,000 plant for extraction of petro-chemicals from natural gas planned by **United Fuel Gas Co.** in **Kenova, W. Va.** . . . **Wheeling Steel Corp.** planning $4,500,000 expansion in **Benwood, W. Va.**

East South Central

16,000 sq ft addition costing $70,000 planned for **Bay Slacks Co.,** in **Bay Minette, Ala.** . . . **Mid-South Industries, Inc.** constructing $100,000 shirt plant in **Hackleburg, Ala.** . . . $500,000 office building planned by **Normandy Development Co.** of Memphis in **Huntsville, Ala.**

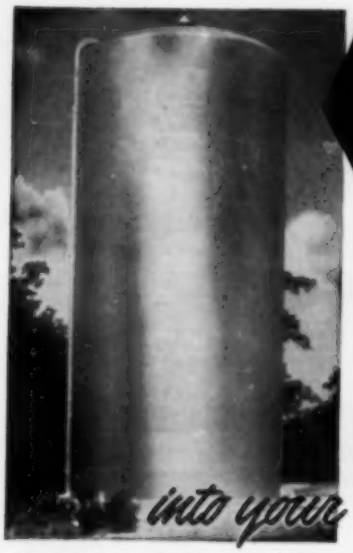
Modglin Corp. erecting $106,000 plant in **Hazelhurst, Miss.** for the manufacture of household items . . . $500,000 plant underway in **Jackson, Miss.** for **Atlas Tile & Brick Co.** . . . **Flintkote Co.** to spend several hundred thousand dollars expanding its wood pulp and products plant in **Meridian, Miss.**

West South Central

Fox Mfg. Co. constructing 43,000 sq ft sheet iron manufacturing plant in **Fort Smith, Ark.** . . . Underway in **Little Rock, Ark.** is $350,000 plant addition for **Hankins Container Corp.** . . . **Allied Chemical & Dye Corp.** planning aluminum sulphate plant in **Pine Bluff, Ark.** . . . Mid-1959 completion anticipated for $5,500,000 electronically - controlled switching and classification yard for **St. Louis & Southwestern Railway** in **Pine Bluff, Ark.** . . . $500,000 poulty processing plant to be erected in **Springdale, Ark.** for **Edward Aaron Corp.**

Gaylord Container Corp. planning new paper mill for **DeRidder, La.** . . . Multi-million dollar offshore oil pipeline and gathering system to be built by **Continental Oil Co.** in **Grand Isle, La.** . . . $1,500,000 natural gas cycling plant being constructed on 8 acre site in **Klotz Springs, La.** by **Anchor Gas Corp.**

$4,500,000 pipeline and compressor station being constructed by **Pioneer Natural Gas Co.** in **Amarillo, Tex.** . . . **Celanese Corp. of America** laying plans for construction of polyol plant in **Bishop, Tex.** . . . $75,000,000 gas processing and cycling plant to be erected in **Corpus Christi, Tex.** by **Humble Oil & Refining Co.** . . . Multi-million dollar expansion planned for **Southland Paper Mills** in **Lufkin, Tex.** . . . **Brazos River Electric Coop., Inc.** planning $6,000,000 power plant in **Weatherford, Tex.** . . . Being planned in **Weslaco, Tex.** is $296,000 lab, office and greenhouses for **General Service Administration.**



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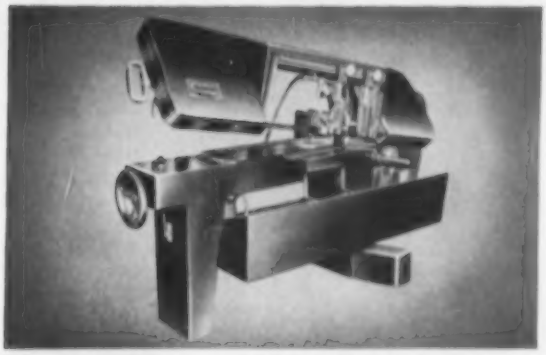

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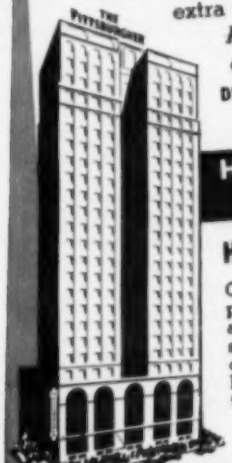

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FUTURE EVENTS of Engineering Interest

Oct. 1-4; National Association of Corrosion Engineers, South Central Regional Meeting, Oklahoma City, Okla.

Oct. 7-9; 13th Annual National Electronics Conference and Exhibit, Hotel Sherman, Chicago, Ill. Conference headquarters at 84 East Randolph St., Chicago 1, Ill.

Oct. 7-11; American Institute of Electrical Engineers, Fall General Meeting, Chicago, Ill.

Oct. 16-18; Southeastern Electric Exchange, Sales Conference, Tutwiler Hotel, Birmingham, Ala.

Oct. 21-25; 45th National Safety Congress & Exposition, Chicago, Ill. R. L. Forney, Gen. Secy., 425 N. Michigan Ave., Chicago 11, Ill.

Oct. 25; Southern Regional Meeting, Natural Gasoline Association of America, Washington-Youree & Captain Shreve Hotels, **Shreveport, La.** William F. Lowe, Secy., NGAA, 421 Kennedy Bldg., Tulsa 3, Okla.

Oct. 28-30; 10th Annual Power Distribution Conference, University of Texas, Austin, Texas.

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needs NO maintenance with the ROTARY DISC

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Stainless steel rotary disc valve offers 15 calibrated orifices to provide any rate of flow. Sediment chamber protects orifices from plugging. No moving parts to wear out or leak.

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THE UNIBLOW VALVE COMPANY
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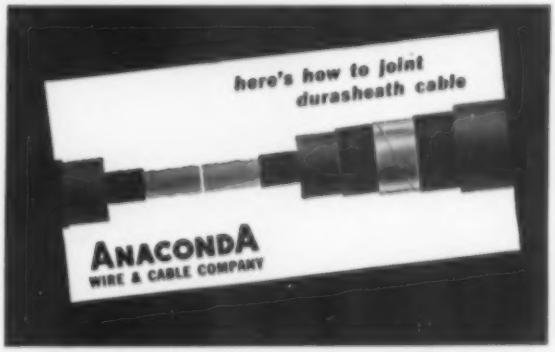
for faster splicing of neoprene-jacketed cable



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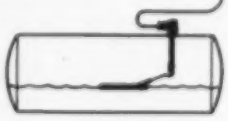
Several sizes available. Approved by Underwriters Laboratories and Factory Mutual. UL approved switches.

Write for complete details, to Dept. F.



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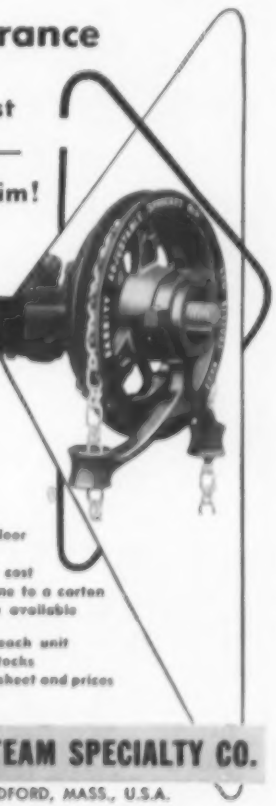
THINK of Babbitt

Adjustable
SPROCKET RIM
with Chain Guide



- Simplifies pipe layout
- Fits any size valve wheel
- Easy to install and operate
- Operates any valve from plant floor
- Time and money saving fixture
- No maintenance; first cost only cost
- Packed, completely assembled, one to a carton
- Hot galvanized, rust-proof chain available for all sizes
- Easy to follow instructions with each unit
- Your supplier carries complete stocks
- Write for new descriptive catalog sheet and prices

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3 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

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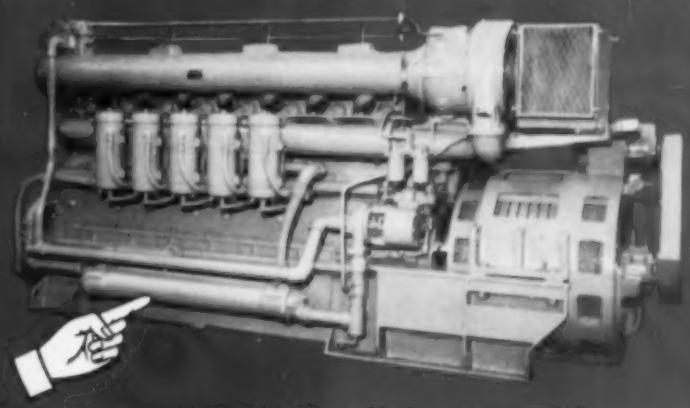
ROSS EXCHANGERS

on the move in Venezuela



cooling lube oil in two White trailer-mounted diesel generator sets

Venezuela is booming with an economy that demands mobile electric power — and sometimes in a hurry! Representing "the latest word in highly maneuverable, trouble-shooting power plants," two of these 500 KW White Mobile Diesel Generator Sets have been purchased to furnish replacement power in areas where power lines and systems are being rerouted and expanded.

To keep each 712 BHP Superior Diesel running at the most efficient operating temperature, White Diesel Engine Division selected a Ross Exchanger for lube oil cooling. Longer engine life and more reliable performance under changing conditions are thus assured.

Because of their ruggedness and high thermal efficiency, Ross Exchangers are widely used as standard equipment on engines, compressors and other machinery for cooling lube oil, jacket water, air and gas.

Why not learn more about these compact, pre-engineered units? They are fully standardized and available in a wide range of sizes to meet your needs. Write for Bulletin 1.1K5. Ross Heat Exchanger Division of American-Standard, Buffalo 5, N. Y. In Canada: American-Standard Products (Canada) Limited, Toronto 5, Ont.

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Division of AMERICAN-Standard

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